

MACWORLD

August 1987 \$3.95
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The Macintosh™ Magazine



The Mac Goes **MS-DOS**

*Three paths
to connectivity*

**9 Tape Drives for
Hard Disk Backup**

**Desk Accessories
Boost Performance**

**A Printing Primer
for Publishers**

**Macintosh and
the Music Business**

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Don Crabb, *InfoWorld*, November 10, 1986

“Microsoft Excel is unquestionably the most powerful spreadsheet program available on any personal computer.”

Lon Poole, *Macworld*, September 1985

“In terms of features and ease of use, Microsoft Excel makes 1-2-3 look rather pale.”

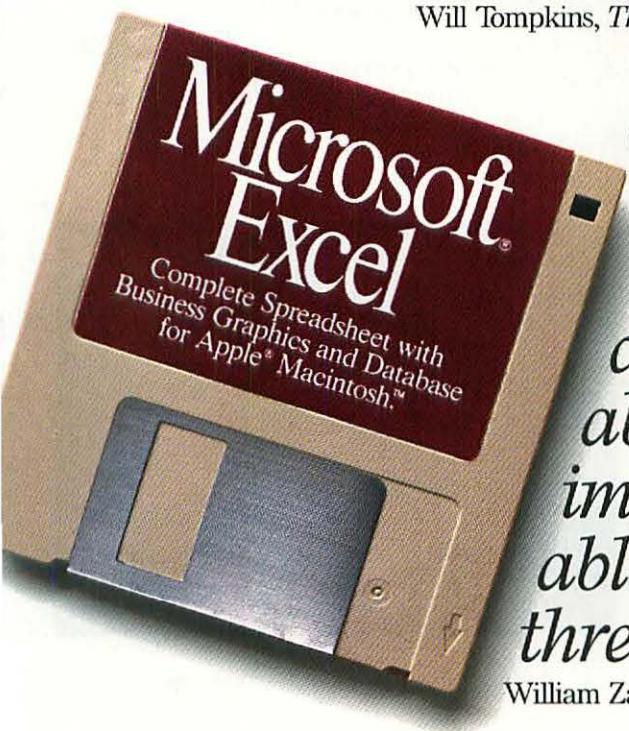
The Seybold Outlook On Professional Computing, October 20, 1986

“Microsoft Excel is easy to learn, but better, it's also easy to use. Best of all, you can easily get at Microsoft Excel's powerful macro capability.”

Jerry Pournelle, *Byte*, April 1986

“Microsoft Excel has implemented the most all-inclusive and powerful use of linking yet seen in micro spreadsheets... It offers what appears to be an almost unlimited range of application possibilities.”

Will Tompkins, *The MACazine*, Vol. 2, No. 10



“A powerful spreadsheet program with equally powerful data-base and charting (or graphics) capabilities, it offers substantial improvements over comparable PC-DOS programs in all three areas.”

William Zachmann, *Computerworld*, December 8, 1986

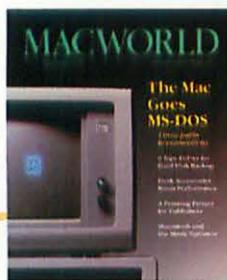
It seems we underrated it.

Microsoft®

MACWORLD

August 1987

The Macintosh™ Magazine



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If you're surprised to see this IBM on the Macworld cover, wait till you see a PC program on the Mac screen. For details on IBM connectivity, see p. 108. (Photograph by David Bishop.)

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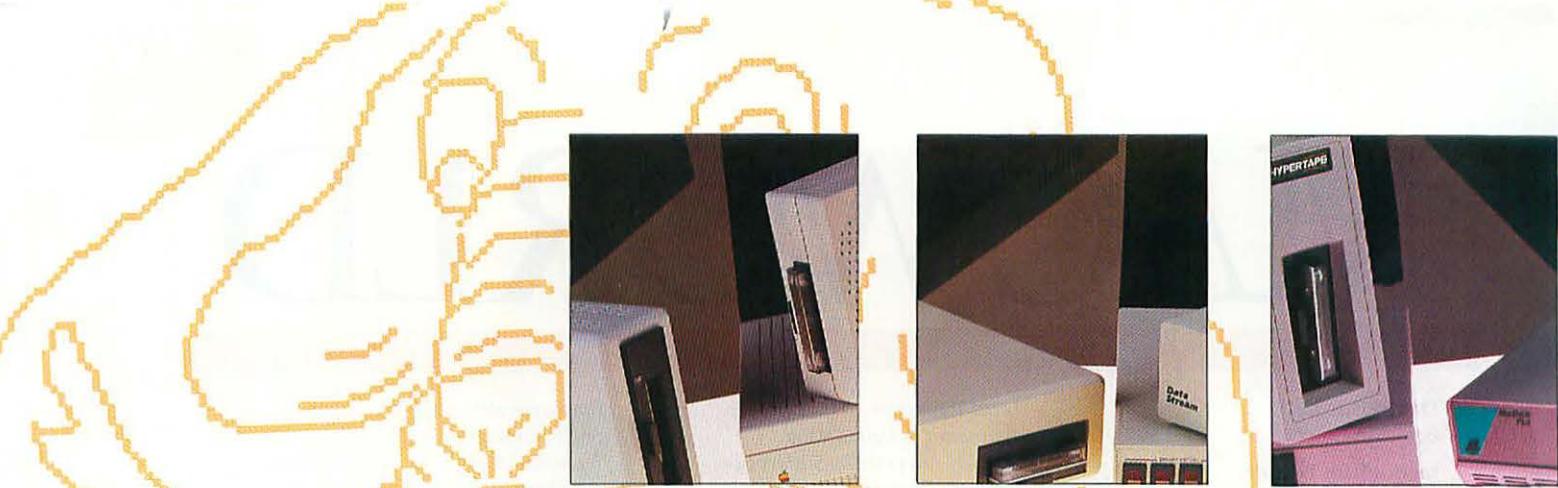
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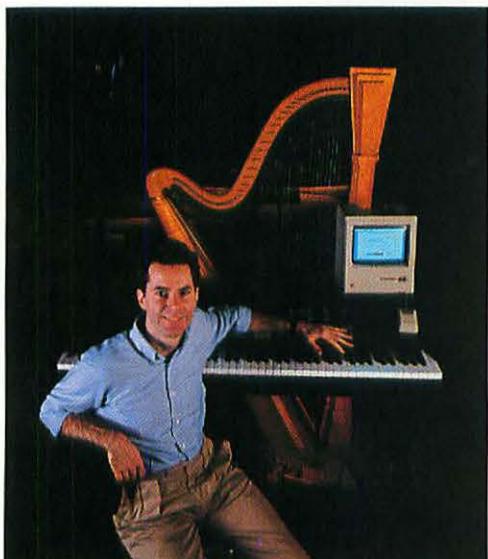
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MACWORLD

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Turbo Mouse has two mouse buttons - one for right-handed users and another for lefties. And, since it's only 4" x 6", Turbo Mouse will fit neatly at the end of your keyboard.

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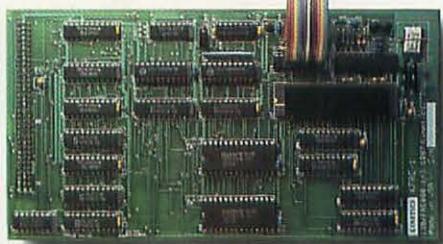


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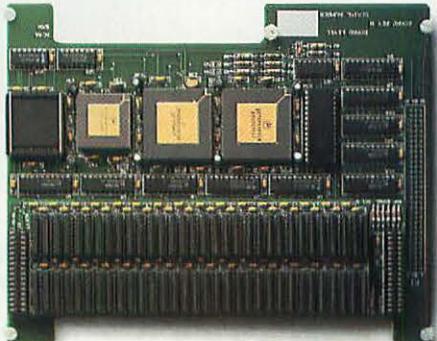
THINK



Macintosh SE. The perfect place to start building—equipped with a built-in 20MByte hard disk (or a second internal floppy) and one internal expansion slot.



Plug a card into the SE and make a quick connection with mainframes and networks.



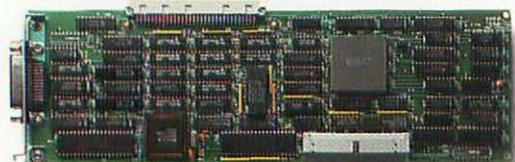
Floor it. In a Macintosh SE, a 68020 accelerator card gives you license to exceed the speed limit.



Add a 5.25" disk drive, and (with the right card) you can use information created on IBM or compatible PCs. Or run MS-DOS programs.



A new keyboard, re-designed for the new generation of Macintosh computers.



In scientific or engineering applications, a special card can connect an SE or a II to lab instruments.

The new AppleColor® High-Resolution RGB monitor can create brilliant hues and true gray scale on your Macintosh II. In finely-detailed 640 x 480 pixel resolution. Also available: a 12" monochrome monitor.



How to build your

You've heard about them. You've read about them. By now, you've probably even seen them.

Our latest leaps in technology, the new Macintosh™ SE and Macintosh II personal computers, have been getting their share of press.

But to add to what you may already know, we'd like to tell you more about their most powerful feature: expandability.

It's something we made possible by adding expansion slots. So you can easily customize your Macintosh to meet the demands of any business.

You can, for example, set up a system that's perfect for major-league number crunching. Or add features to give you even greater power for Apple Desktop Publishing, like displays as big as 21 inches.

The SE sports one expansion slot.

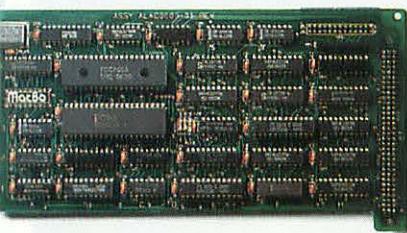
While the Macintosh II takes the idea of expansion to the extreme—with six 32-bit NuBus slots. Which have the good sense to configure themselves, and require you to do nothing more than plug in the options of your choice.

Such as an 80286 co-processor card that lets you run programs written for MS-DOS computers. And a video card that produces near-photographic images

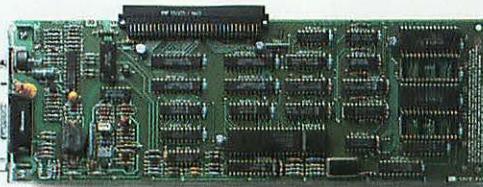
representing the Apple Extended Keyboard. Complete with 15 programmable function keys, as well as separate cursor and numeric keypads.



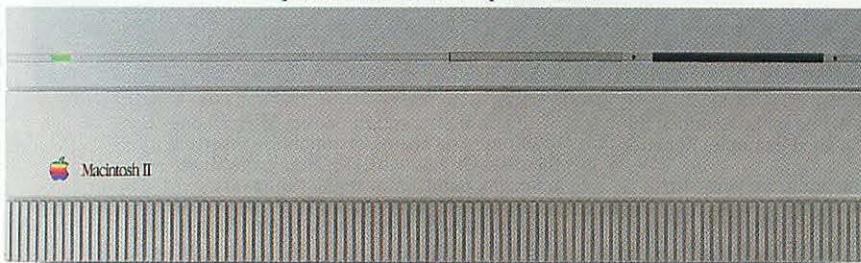
Via the expansion slots, you can add an AST co-processor card to either the SE or Macintosh II.



Using one of the II's six slots, you can tie into the company intranet or an office network like Ethernet.

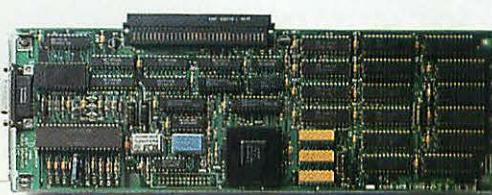


Build yourself a power station. The Macintosh II has a lightning-fast 32-bit Motorola 68020 processor, a 68881 co-processor and six NuBus expansion slots.



With either the SE or the II, a large-screen monitor (available from other manufacturers) can give you the big picture. And show you up to two pages at once.

If you lose it, you can't use it. The Apple Tape Backup 40SC safeguards the work on your hard disk. Pronto.



The Macintosh II Video Card can generate colors 256 at a time, up to eight bits per pixel. Using a palette of over 16 million colors.

own Macintosh.

from a palette of over 16 million colors.

The new Macintosh computers are built to be customized in other ways, too.

You can set up your SE with up to four megabytes of memory, so it has the power to run the most sophisticated programs. And configure the II with up to eight megabytes of memory on the main board, or a walloping 1.5 gigabytes using the expansion slots.

As for storage, there's plenty. With either computer, you get the option of an internal hard disk. Or an external one that can store up to 80 megabytes.

You can also choose between two keyboards. One of which has 15 function keys that come in handy when delving into special applications.

And as you might expect, we've done more than just give you a very good

way to build the Macintosh of your dreams.

We've also arranged to make sure you have the perfect workshop: an authorized Apple® dealer.*

Where you can get some expert assistance choosing your options.

So all you have to do is stop in. And get to work.



The power to be your best.™

THE NEW YORK TIMES:

"MicroPhone is a breakthrough in communications software..."

LOS ANGELES TIMES:

"The program is more sophisticated and easier to use than any...on either the PC or the Mac."

MACWORLD:

"...brings together the best traits of every Mac communications program."

INFOWORLD:

"MicroPhone is the easiest communications package we've seen."

With reviews like these who needs advertising?

They say the best advertising is word of mouth. So we're reprinting some of the multitude of words that have already been said about MicroPhone communications software for the Macintosh.

And what they're saying, universally, is that MicroPhone—created by Dennis Brothers—is far outdistanced all its predecessors. That for the novice, MicroPhone is the simplest telecom software ever devised. That for the expert, MicroPhone is the most powerful.

On-line for the lazy.

MicroPhone gives you the means to create infinitely elaborate macro (automated) routines with infinite simplicity. Its powerful script language is written in plain English, and it also features a recording mode that watches, saves, and repeats what you do. So no programming skills are required.

The upshot is that MicroPhone will save you time, hassle, and on-line fees by automating virtually every operation you now

have to key by hand. Log on procedures. File transfers. And, for a good example, E-mail retrieval routines.

At a single command from you, MicroPhone will dial your E-mail service, give your ID number and password. Navigate its way through the labyrinth to your mailbox. Check for mail. Log off if there is none. And if there is, MicroPhone will collect, print, and save all messages to your disk. Then, politely log off.

If you prefer, you can direct MicroPhone to initiate this sequence simply by inserting the disk. Or automatically, at any specified time, day, night. Or at regular intervals.

Anything else you need to do, from collecting stock quotes to sending and receiving files, is just as simple.

Try it out at home or office.

You can find out firsthand just what a remarkable program MicroPhone is. Without risking a cent. We give you a thirty-day moneyback guarantee, no questions asked. Which is virtually unprecedented in software.

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MicroPhone™
Communications Software
for the Macintosh



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Choice Award

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- MACTERMINAL 1.1
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- VT52
- VT100
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- Printer On/Off
- Auto log on scripts for information utilities provided
- Scripts Invoked by Button Menu Command Key
- Scripts have full logic constructs
- Works with ALL Macintosh models & LaserWriter
- Works with all sync modems (Hayes included)
- Includes Switcher & Compuserve subscription
- Includes text editor licensed from Dreams of the Phoenix Inc.
- Documentation by Neil Shapiro

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ity to the SE through clip-on MegaModules (\$99 each). The first two modules are MMVideo, which offers user-definable video capabilities—including NTSC, PAL, and external Mac standard signals—and MegaModule Developer Kit, which allows access to the Mac SE's data bus through a 60-pin connector.

More Fonts and Printers

► Speaking of PostScript, two additional high-resolution plain-paper printers are coming on the market. From East Hanover, New Jersey, comes Varityper's VT600 (\$18,750), a 600-dots-per-inch laser printer that uses its 68020-based raster image processor to produce ten pages per minute. Compugraphic of Wilmington, Massachusetts, is marketing the CG 400-PS (\$29,995), which is Agfa-Gevaert's 400-dpi laser printer with Adobe's Atlas raster image processor, a 20MB hard disk, and 73 fonts. Qume Corporation of San Jose, California, introduced Script-Ten, a 300-dpi, ten-pages-per-minute laser printer that offers emulation of the HP LaserJet Plus. Script-Ten comes in a 2MB version (\$4795) and a 3MB version (\$5295).

New fonts due out from PostScript originator Adobe Systems include New Gothic; Tiffany; Cooper Black; Carta (a cartographic font developed at Adobe); and two sets of Letraset display fonts—one set contains Stencil, Hobo, and Brushscript; the other offers Aachen, Revue, University Roman, and Freestyle Script.

The More DAs the Merrier

► A forthcoming utility, *Suitcase*, will let you load up on fonts, F-keys, and desk accessories to your heart's content—without resorting to the Font/DA Mover shuffle. The small Init (which you install simply by dragging its icon into the System Folder) comes from Steve Brecher, who is also responsible for the shareware Finder-substitute *WayStation*. Originated by another programmer, Ron Risley, to break through the Mac's restrictions on the number of desk accessories, Brecher's current beta version provides instant access to practically unlimited quantities of fonts, F-keys, and desk accessories, all without any System installation. Savvy followers of utility programs may recognize *Suitcase* as the successor to *Da Thing* and *Da Mob*.

Suitcase requires 512K or more RAM and works with the recently introduced Mac SE and Mac II; the utility will not be copy protected.

In a departure from his past efforts, Brecher plans to commercially distribute the utility himself, this time posting only a demonstration version of *Suitcase* on information services like CompuServe.

PC Network Files Chapter 11

► PC Network, a Chicago mail order hardware and software supplier, filed for protection from its creditors under Chapter 11 of the Federal Bankruptcy Code. The company, which grossed about \$40 million last fiscal year, at press time owed about \$5 million to creditors, including roughly \$1 million to consumers. Most of that

\$1 million is owed to customers whose purchases were on back order, according to company president Steve Dukker.

The company canceled all back orders in May (people who still want the goods must call in again). People who paid for unreceived goods with a credit card can make a charge-back claim to their credit card company (tips for charge-backs were printed in "Navigating the Mail Order Channel," *Macworld*, March 1987).

According to Dukker, the company is now operating profitably but remains saddled with debt from a business slump a year ago. Dukker predicts that the company will emerge from Chapter 11 this fall—as long as PC Network's reorganization plan is accepted by its creditors—with a little help from investors who were waiting in the wings at press time.

Desktop Publishing Network

► The latest wrinkle in desktop publishing: *multiuser* page layout. Migent of Incline Village, Nevada, is introducing a page-makeup program that works on a network, so a group can compile a publication by committee. The \$395 product, due out this summer, promises to be the Mac's first multiuser electronic publishing system.

Tentatively named *Lighthouse*, the program provides all the standard features, such as kerning, adjustable leading, and positioning text and flowing it across pages, as well as advanced graphics capabilities and a substantial word processor with a thesaurus, a glossary, and a spelling checker. Text files can be shared to the para-

graph level and graphic objects to the single-object level (no two users can work simultaneously on the same paragraph or object). *Lighthouse*, which runs on the Mac Plus, the SE, and the Mac II, can also import text and graphics from MS-Word files, providing yet another dimension of networking functionality.

Migent also publishes *In-House Accountant* and makes a portable battery-operated modem that works with the Mac.

More Graphics en Route

► Deneba Systems of Miami, Florida, creator of *MacLightning*, *Voila*, and *Memorandum* (all published by Target Software), is preparing to launch *Canvas*, a \$195 graphics program in the same vein as Silicon Beach's *SuperPaint*. The new program, due out this summer, integrates bit-map graphic tools like those of *MacPaint* and object-oriented tools like those of *MacDraw*. The product, which allows designers to embed PostScript commands, comes with a desk accessory version that will later be released separately.

Add-on Ethernet

► An adapter board developed jointly by Apple and 3Com will let the Macintosh II connect directly to a 10-mega-bit-per-second Ethernet network that enables Mac and IBM PC users to share the same files on a single server. The board, due out by the end of the year, will be marketed by Apple as EtherTalk (\$899); 3Com will market it as 3+Mac (under \$600). A version for the SE is also forthcoming. □

In Expert Assistant

Enabling Technologies' newly introduced statistical analysis program, tentatively titled *SmartStat*, not only supports color (how about color coding for better window management?) and accepts files in ASCII, 1-2-3, and SPSS formats, but it comes with a unique form of help. Rather than the typical window of text, *SmartStat's* desk accessory called the Assistant aids you interactively. The Assistant helps you decide whether to choose nonlinear regression, crosstabs, or two-way ANOVA analysis by asking you questions in simple English and drawing upon a built-in knowledge base to offer you alternatives.

The Assistant could be paired with knowledge bases on subjects other than statistics. In fact, Enabling Technologies may offer its intelligent help system to other developers to include with their programs.

Upgrades for SE and Mac II

Rumors of incompatibilities between the new Mac SE and Mac II and some existing application programs have been followed by a spate of announcements of forthcoming software updates. Microsoft has announced version 1.04 of *Excel*, which is Mac II and *AppleShare* compatible and free to registered 1.03 users. West Corporation has upgraded to version 1.1 the *Publish Pac* software that accompanies its *IC Scan Plus* desktop scanner, which works with the SE and with Adobe Systems' *Illus-*

trator. Software Ventures' *MicroPhone* was scheduled to go into version 1.1, with SE and Mac II compatibility as well as improved VT100 emulation. Expect many more upgrade announcements this summer as application software evolves to keep up with the new hardware.

Music Makers

Integrated Music Systems of San Carlos, California, has begun shipping the Dyaxis 16-bit audio-to-digital conversion system that "makes the Mac sound like a compact disk," according to company president Jerry Kearby. The SCSI device samples sounds at the professional standard rates of 48 and 44.1 kHz, but it also allows users to specify lower sampling rates to conserve space on the accompanying disk drive. The Dyaxis software, designed by Adrian Freed, a programmer who helped design the sound environment at internationally renowned IRCAM in Paris, allows mouse-driven editing of the sound waveforms and mixing of digitized sounds to create new sounds altogether.

Intended for a professional audience, the Dyaxis conversion device costs \$3000; the accompanying hard disk drive adds \$250 (80MB) to \$9500 (380MB). Look for news about similar Mac II developments that will bring the price of the technology down to a point at which nonprofessionals can afford it.

Micah Drives Again

IDT of Newark, Delaware, a company that included Micah drives in its packages of hardware and software for dental offices, has taken over marketing the drives, which had been unavailable since the West Coast hard drive maker declared bankruptcy last November. The new supplier, calling itself Micah Storage Systems, acquired the assets of the ailing company and the license to the technology and now plans to reissue Micah's internal drives for the Mac 512K and the 512KE. The company also expects to introduce an internal drive for the Mac SE, 30MB and 45MB external drives, and a 45/45 drive/tape backup combination.

Additionally, the company will market video technology developed by IDT: the Micah Vision (\$450) and Micah DoubleVision (\$750) high-resolution monochrome video boards for the SE, originally intended to display, manipulate, and enhance X-ray images. The 32-bits-per-pixel monochrome video boards for the Mac II will debut at the Macworld Expo this month.

Micah Storage Systems plans to perform repairs at cost for people who bought drives from the original maker and will offer a program similar to a one-year warranty to those owners for a few hundred dollars.

Aldus to Go Public

Riding on the success of its *PageMaker* page-layout program, Seattle-based Aldus Corporation made a public offering

of 1.35 million shares of its stock. The stock was expected to open at \$14 to \$16 per share, which would raise up to \$21.6 million.

The desktop publishing field that *PageMaker* pioneered has become increasingly competitive, but Aldus has kept in step with a new Mac version as well as an IBM version of its program, which has been selected by IBM for distribution with its new hardware.

More SE Options

Last month we reported on internal hard disk drives for the Mac SE from Rodime and CMS Enhancements. Mirror Technologies of Hugo, Minnesota, is also offering 30MB (\$1095) and 45MB (\$1295) internal drives, bundled with Think Technologies' *Laser-Speed* laser printer spooler, Mirror's ImageWriter spooler, and Mirror's backup software.

Micrographic Images of Canoga Park, California, maker of the MegaScreen, is shipping the first large-screen monitors for the Macintosh SE. The 19½-inch MegaScreen SE and SE*M monitors (\$1995 each) come with a video interface board, a cable, and *MegaTalk*, an E-mail program that runs on the SE's internal monitor. The MegaScreen SE can accept an optional math coprocessor (\$349). The SE*M incorporates Micrographic Images' modular expansion interface card that allows users to add functional-

(continues)

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The Ultimate Tool Of The Trade.

The image shows a vintage computer system from the late 1980s. In the center is a Radius Full Page Display (FPD) monitor, which is a large CRT screen designed to fit over the top of a standard Macintosh monitor. To the left of the FPD is the Macintosh Plus computer tower, which has an Apple logo on its side. To the right of the FPD is a smaller monitor displaying a graphical user interface with icons and text. The FPD screen itself displays a document titled "THE RADIUS REPORT" with several columns of text and a sidebar with "Technical Specifications".

THE RADIUS REPORT

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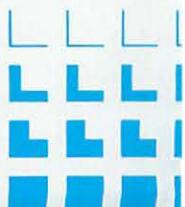
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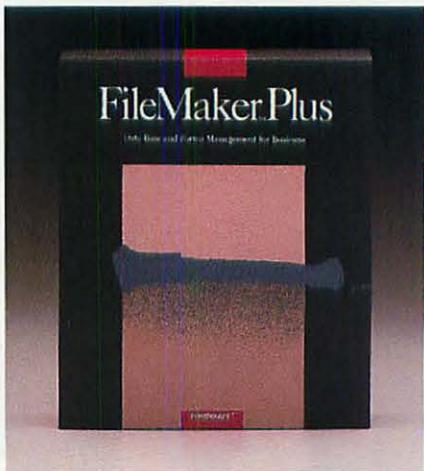
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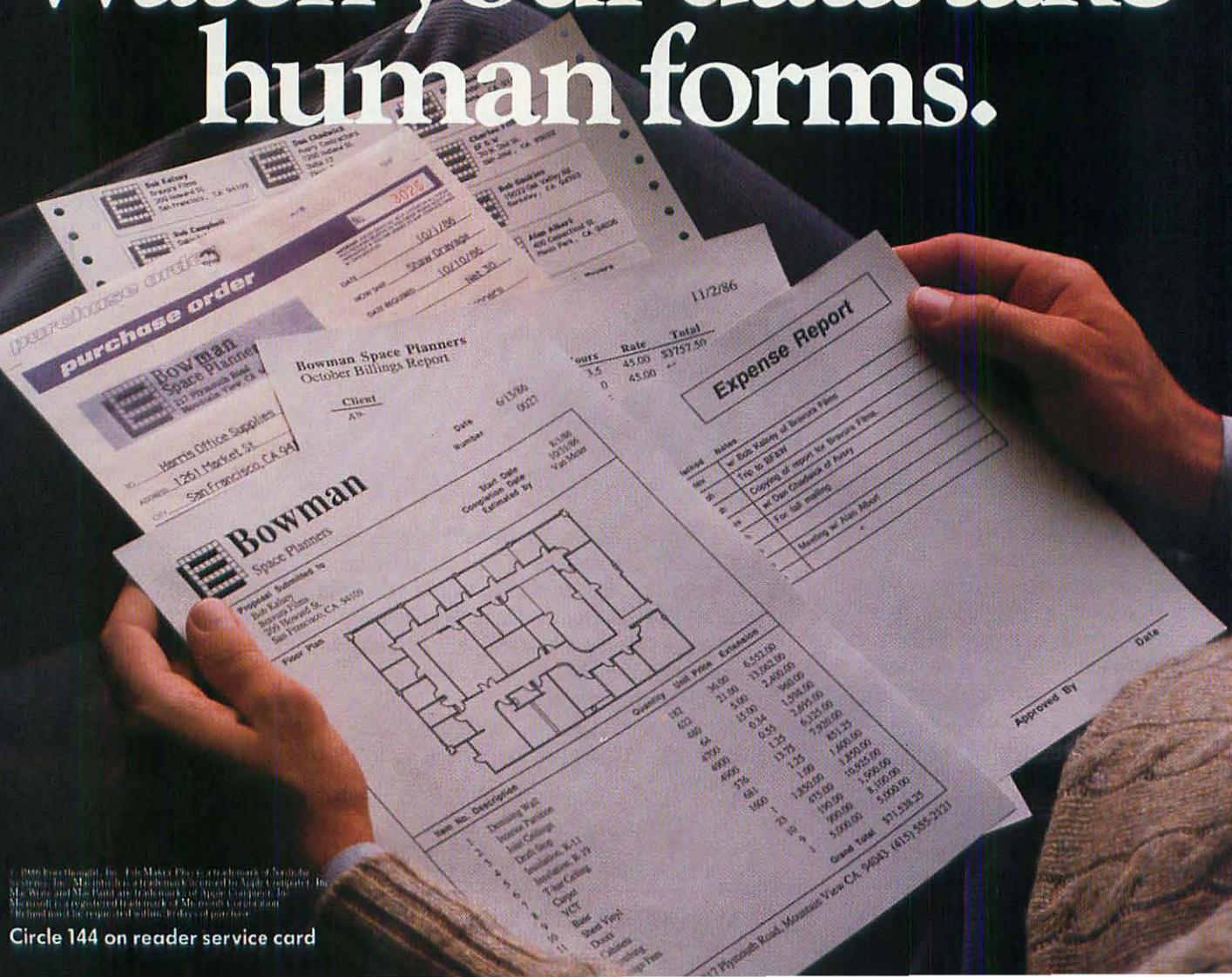
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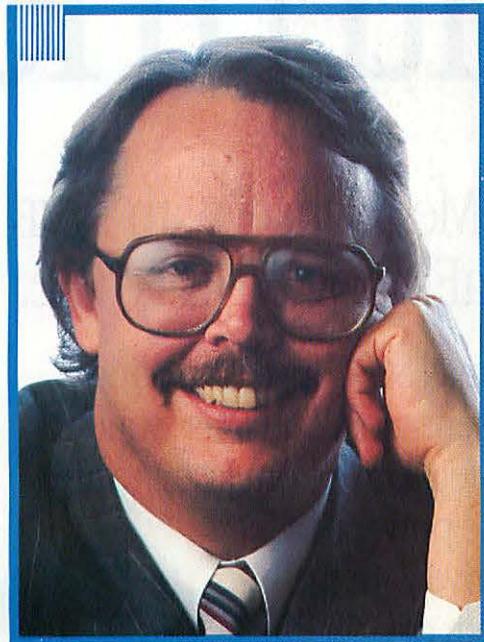
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Campbell's Software



No matter how you slice it, an Apple is an Apple is an Apple. And so is its software.

Apple Computer's brand-new software company, which is headed by its former vice president of sales, Bill Campbell, may be as yet unnamed. But no matter what label Apple decides to stick on that can of software, you can be sure of one thing. It's going to achieve instant recognition among Macintosh consumers.

In fact, this new firm is already the fourth-largest software company in the market—ranking right behind Microsoft, Lotus, and Ashton-Tate—just by virtue of its less than humble origins.

Of course, it helps to have a great catalog of existing software. Just a glance at the *Macworld Best-Sellers* list on the last page of this magazine shows some of the company's powerful initial offerings—*MacDraw*, *MacPaint*, *MacTerminal*, *AppleTalk*. Not too shabby for a start-up.

The firm's immediate task is to get out the software products that it has in-house. Reportedly, there are some new versions of *MacProject* and *MacDraw* as well as some other programs in the pipeline.

The charter of Apple's new software company is to find products that will fit into areas that Apple has not yet penetrated. Its mission, simply put, is to become the most profitable and most successful software company in the world.

With Apple's funding, Bill Campbell's ace marketing skills, and a crack team of Apple alumni on board (including Campbell's right-hand man, John Zeisler, and software evangelist Kyle Mishima), the company might just be able to pull it off.

Having the inside track on Apple's future product line will virtually guarantee the company's success—especially when you consider that it takes a year or two to develop programs for the market. That's a big edge to have over the competition.

Call it inside trading of ideas, or whatever you like. Such synchronicity is felicitous, and probably downright profitable.

The question is, what's going on? Is Apple in the software business or not?

You may recall Apple's decision to quit the software market. That was announced soon after its former software evangelist

Guy Kawasaki left in a huff and a puff to start his own company, Acius, and market the fabled Silver Surfer database—which Apple had originally intended to bring out.

That is, Apple was going to bring it out until a number of third-party software developers, including Microsoft and Ashton-Tate, ganged up and threatened to do terrible things like cry and gnash their teeth and pull out of the Macintosh software market if Apple persisted in releasing this whopper of a database that would compete with their own products.

As the saying goes, when faced with the Ayatollahs of software and their fundamentalist wrath, Apple blinked.

The entire sordid tale has yet to be told: all the machinations, gyrations, intrigues. Not to mention the secret trips to Paris to visit the brilliant young French programmer Laurent Ribardière, who had created Le Silver Surfer under the watchful and shrewd eye of his software patron Marylène Delbourg Delphis.

It's a tale of broken promises, tarnished ideals, and business as usual. If John Le Carré wrote about software, he might have tackled that story. He could have called it *The Software that Came in from the Cold*.

Suffice it to say, Apple had to decide then and there whether to remain in the software business or not. The decision was crystal clear. It was "yes and no."

Apple couldn't risk alienating third-party developers by releasing Silver Surfer. After sacrificing that program to the wolves (it's now Acius's *4th Dimension*), Apple scrambled to reorganize itself so that such a lost opportunity would never haunt it again.

Actually, it was a wise move for Apple to cut a wedge out of itself. As an independent unit, the new software firm will probably be able to make decisions faster and make progress without all the political headaches and bureaucratic nightmares

(continues)

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David Bunnell

that are so common at Apple. It will be able to focus on just one thing—developing software.

But despite all the corporate camouflage and declarations of independence, the new situation is still very confusing to most third-party developers. Is there or isn't there a conflict of interest?

First of all, remember that Apple has a group of evangelists whose job it is to work with third-party developers—to encourage them and to steer them in the right direction. Apple also has a venture fund to provide backing for outside product development. In this way, the company has backed Forethought, maker of the popular *PowerPoint* presentation graphics program—reportedly to the tune of about \$7 million. It has also assisted Touch Communications in bringing out its OSI (Open Systems Interconnect) communications program, expanding the Mac's connections with other computers. And Apple is looking at funding another half-dozen firms by the fall.

So what's the dilemma?

Apple's own software spin-off is supposed to be treated just like any other independent company, without any special privileges. Along with the rest of the crowd, it's expected to hustle and cajole Apple in order to obtain comarketing assistance and support. However, given the nature of its relationship to Apple, how can anyone believe that it's not enjoying a tremendous built-in advantage?

This is bound to create bad feelings among software developers. So, what is Apple really up to?

I'm going to do some theorizing, with my crystal ball.

Is the real conflict of interest here with third-party software developers? Is Apple setting itself up against itself? Or does it see something no one else sees yet?

Take this future scenario. Apple's software company is a big hit. It spins off and goes public. Let's say that people who own Apple shares will get ten for one, and the new shares can be bought and sold on the market just like shares of Apple Computer. Now, as a firm that is inherently responsive to its mother company, if Apple's software spin-off is only developing Macintosh-based software, won't it be limiting itself?

(continues)

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Shouldn't it be publishing software for any machine that's viable, as long as money is being generated?

After all, lots of products are developed for the Mac that could be ported to other systems.

Maybe that's exactly what Apple's game plan is for the future. Maybe it is planning to develop, say, UNIX-based products that can run on any platform. Maybe this is part of Apple's long-term strategy to take over the software world—and to knock Microsoft and the other big guys off their perch. Maybe it's even indirectly eyeing the IBM PC market. Who knows? After all, it has expressed no strong objection to Forethought's developing a PC version of the Apple-funded *PowerPoint* program.

Maybe Apple's super Cray has been working late at night, churning out scenarios for takeovers, buy-outs, and world conquest.

In case you haven't noticed, there's a massive power play brewing in the software market. We're talking cybernetic

World War III here. Not a shot is going to be fired, either. The whole campaign will be fought with software armies.

Apple's recent maneuver to set up its own software company is just a first step in this direction. I have to conclude that companies like Microsoft and Ashton-Tate are beginning to feel the heat. The competition is suddenly going to become much stiffer for them.

In the near future the software business could start resembling the airline industry with its mergers and alliances. As the cost of software development continues to skyrocket, it's going to become increasingly difficult for smaller companies to stay in business on their own.

Little software companies will be gobbled up by big ones. Established MS-DOS companies will be looking for entry into the already crowded Macintosh market. The major houses themselves will not be sacrosanct. Who knows, the firms on the hit list may well include such giants as Microsoft, Ashton-Tate, Borland International, Living Videotext—and, let's not be squeamish, even Apple itself.

We'll see a new breed of software venture capitalists emerging—the carpetbaggers of software, if you will. They'll be hedging their bets by investing in companies that they suspect—or (shades of Boesky) even know for certain—will be bought out.

All that early plotting behind the scenes to wrest control of Silver Surfer away from Apple was just a mild taste of things to come.

Fortunately, the end user will benefit from these Machiavellian contortions in the Macintosh marketplace. As the competition heats up, software prices will shoot down.

In the meantime, it's going to take several months for Apple's new software company to be up and solid under Bill Campbell's able direction. But once it gets going, look out, because it could quickly become the largest Macintosh software provider outside of Microsoft. That's just for starters.

Perhaps one day Campbell's Software will even introduce a delicious new flavor—*Cream of Microsoft*. □

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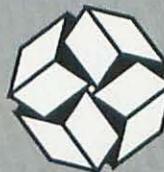
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A rather revolutionary Bering 20 mb Bernoulli compact disk drive system for Macintosh computers. And, the first truly *portable* 5½" system. One that lets you tote around 10,000 pages of data on a sleek cartridge about the size of a piece of bread.

Translated, that's 25 times the storage you get on one standard floppy.

Yet unlike floppies, the Totem is no slouch for speed. It's just as fast as a hard disk. In fact, your computer will think it's a hard disk. You can even share it with co-workers. And its advanced Bernoulli aerodynamics make it resist head crashing. If you've ever used hard disks, you know what a pain that can be.

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"Guide offers such interesting opportunities that there is almost too much that can be done"—MacUser

"Guide points the way to the future"—Macworld

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Letters

A forum for Macworld readers

Moonlighting Detail

May's *Macworld News* shows a picture of Maddie Hayes from ABC's "Moonlighting" with her Mac. While it's nice to see the Mac dressing up the set, doesn't the harried detective know that she risks magnetic interference from the Mac's power supply and video circuitry? The external disk drive belongs on the right side.

Duncan J. McKenzie
Niles, Illinois

Right you are; data on the floppy disk can be damaged if you put the drive to the left of the Mac. Set designers and Mac users take note.—Ed.

Corrections

Stepping Out, mentioned in April's Mac Bulletin, is available from Berkeley System Design, 1708 Shattuck Ave., Berkeley, CA 94709, 415/540-5536.

AutoSave DA (April Mac Bulletin) is available for \$24.95 from Magic Software, 121 W. Mission St., Bellevue, NE 68005, 402/291-0670 or 800/342-6243.

The correct address for Working Software, publisher of Spellswell, mentioned in May Updates, is 321 Alvarado St., Ste. H, Monterey, CA 94930, 408/375-2828.

Data Tailor's Trapeze (Where to Buy, May 1987) lists for \$295. For information about the product, call 817/332-8944.

MapMaker version 2.0 (Where to Buy, 1987) requires only 512K minimum memory.



NICK WIGGANS

High Hopes for a Laptop Mac

I believe there is a tremendous market for a fairly simple, portable Mac in the \$1000 to \$1500 price range. It ought to include an 800K internal drive plus a small EPROM slot (or two 800K internal drives), 1MB of memory, and an internal 1200-baud modem—all fitting into my briefcase. It should also be able to drive a small portable printer, such as the HP ThinkJet. Is the baby Mac afoot or am I just dreaming?

John Eisner
Halifax, Nova Scotia
Canada

You're not the only one dreaming of a small, affordable Mac portable, but so far nobody's made any product announcements. We'll be sure to let you know.—Ed.

Look and Feel

My compliments on David Bunnell's May editorial on the Lotus "look and feel" suit.

We cannot copyright fashions or jokes. That we continue to see new fashions and new jokes each year answers the people

who think that the failure to protect intellectual property will end innovation. Another answer is provided by Lotus itself, which, while pursuing its legal strategy, is also pursuing a creative marketing strategy that includes launching HAL and other add-ons that work only with 1-2-3. Looks to me like the cloning of 1-2-3 has stimulated Lotus's creativity.

Sheldon L. Richman
Fairfax, Virginia

Super Backups

Jim Heid's "Getting Started with Backups" in the February issue was well done. Here's my quick and simple system for backing up my SuperMac DataFrame 20XT.

Using the SuperBackup utility that comes with the disk drive, I copy all my application and system files onto floppies—it takes only about half a dozen floppy disks. I put those aside and hope I'll never need

(continues)

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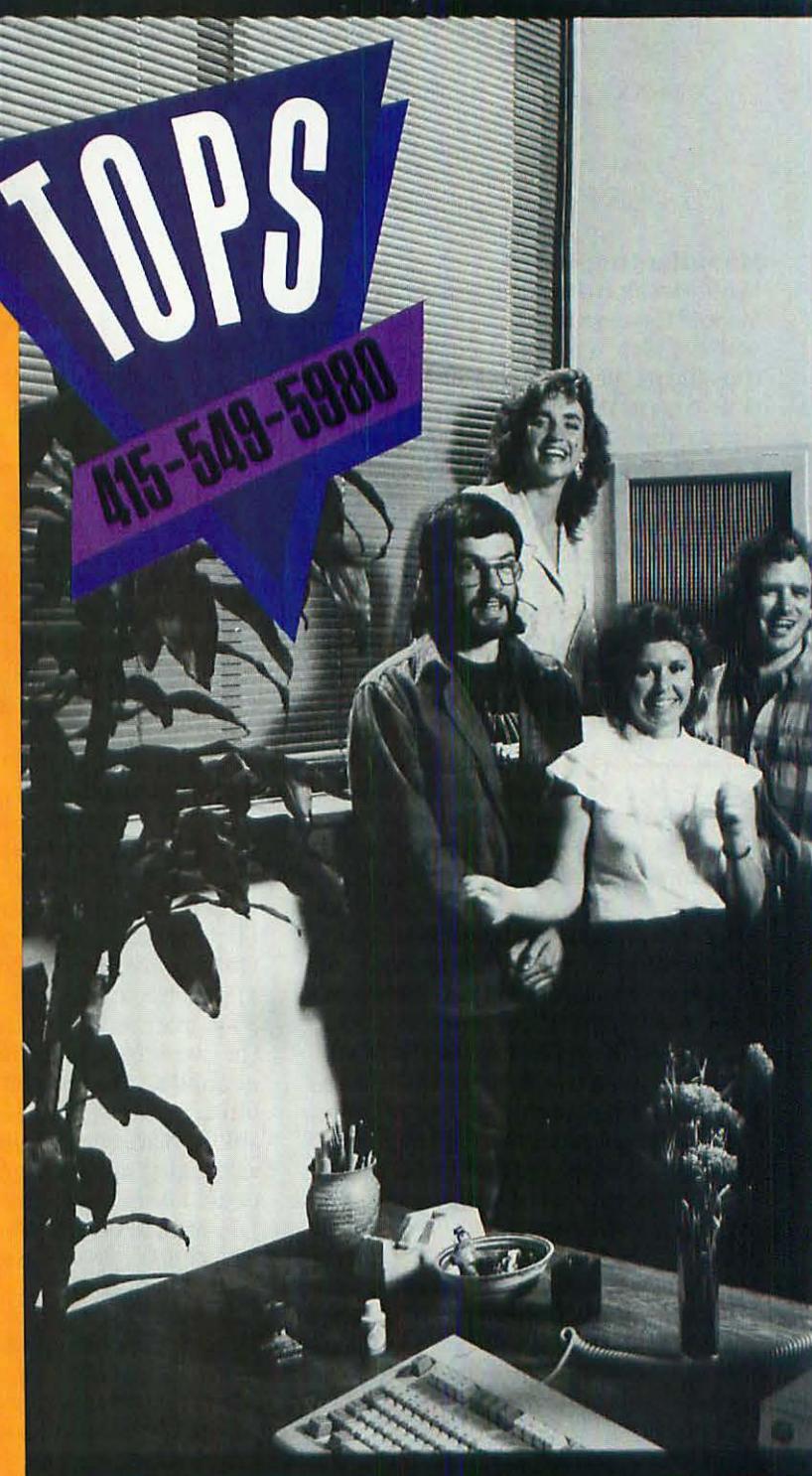
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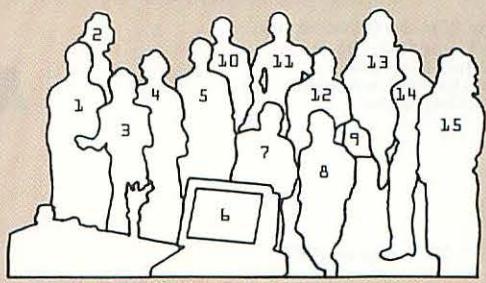
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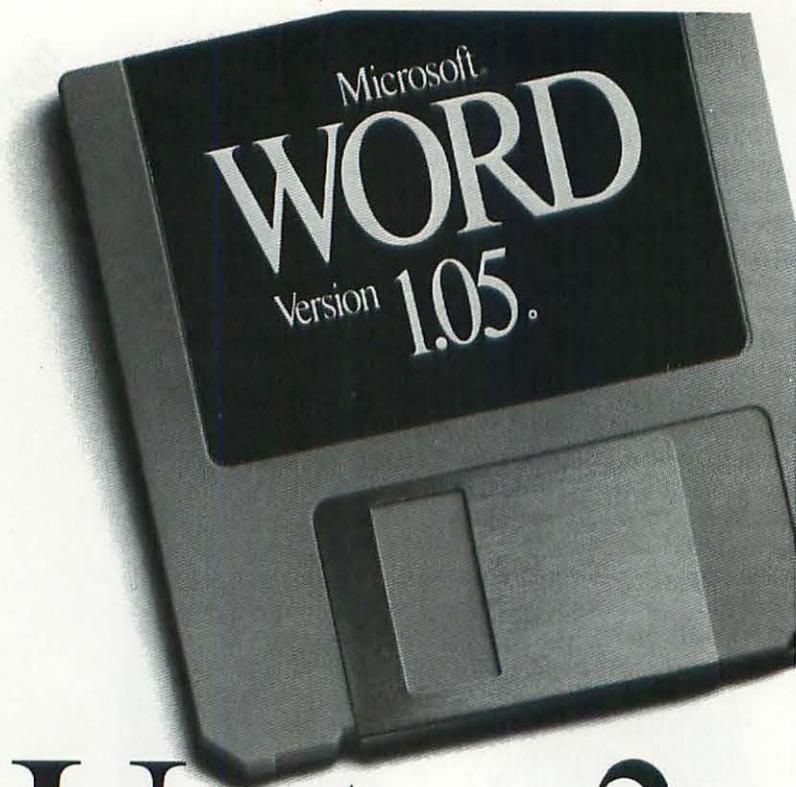


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Letters

to see them again. I organize my documents in folders of less than 800K, and I keep a floppy disk with the same name as each of my document folders. Whenever I've worked on something in a folder I drag a copy of the document, or even the whole folder, onto my backup floppy before I shut down.

The system is so fast and easy that I actually use it. And after all, that's what any backup system is all about.

*Seth L. Haber, M.D.
Palo Alto, California*

Life of a Salesman

Am I the only salesman in the country with a Macintosh Plus rather than an IBM-PC compatible? For Big Blue there are *Prospector's Helper*, *Salesman's Helpers*, *Ex-Sell*, *Broker's Ally*, and more. Does someone provide a Mac equivalent for logging and tracking my sales leads?

*Ted R. Swanek
Dubuque, Iowa*

Breakthrough Productions puts out Market Master, a \$295 application that tracks leads, prompts you to make calls and send letters at the right time, and handles the mail merge automatically. Judging only by how well the program managed Breakthrough's persistent calls to us, Market Master could make your follow-up as systematic as clockwork. Contact the publisher at 10659 Caminito Cascara, San Diego, CA 92108, 619/281-6174.

—Ed.

Getting Started

In the March 1987 *Macworld* there's a piece by Jim Heid, "Getting Started with Spooling," that does not go far enough. Why not run a competitive spool-off and actually give your readers the lowdown?

*Hall Barwood
San Anselmo, California*

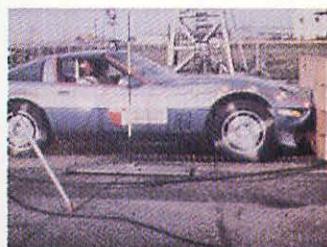
Jim Heid's monthly Getting Started column is intended to provide background for readers who need basic information and to help them get up to speed. Look to the features or the Reviews section for evaluations of products, such as the June 1987 article, "Speaking of Spoolers." —Ed.

Fractal Fan

I couldn't find the *MacFractal* program by Mark Zimmer that Robert C. Eckhardt wrote about in the March 1987 *Macworld*

(continues)

A Crash Course in Accelerator Boards.



TurboMax has passed extensive crash testing.

Listen carefully to the hype surrounding 68020 performance options available for Macintosh computers today.

Faster this.

Quicker that.

Nice, simple, glittering generalities about how fast they run. Now, take a look at the fine print. "May not run properly with some programs" or "certain programs may have to be revised to function correctly."

In other words, many of the programs you work with everyday simply won't work with 68020 add-ons.

They crash.

There is, however, an alternative. One that's 100% compatible with virtually every Macintosh program. **TurboMax**, a "clip-on" accelerator board for your Macintosh Plus or 512Ke.

TurboMax is more than your typical accelerator board. It's a multi-function hardware and software system designed to make you more productive—so you can finish your work sooner.

It consists of a 16MHz 68000 CPU (same as the one in the Macintosh Plus—but three times as fast), RAM expansion to 2Mbyte, a "super-speed" SCSI port, a "beefed-up" power supply and an "ultra-cool" fan.

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With TurboMax, you get pure speed—without sacrificing compatibility. Which means you can work faster—instead of worrying about whether or not your programs will work.

We've also included a couple of MacMemory standards with TurboMax. Like MaxSave, a recoverable RAM disk that prevents you from losing valuable data in the event of a system error. Plus our unsurpassed one-year warranty.

So if you'd like to get more performance out of your Macintosh Plus or 512Ke, call us today at (800) 862-2636 (in California, call (408) 922-0140) for the authorized dealer nearest you.

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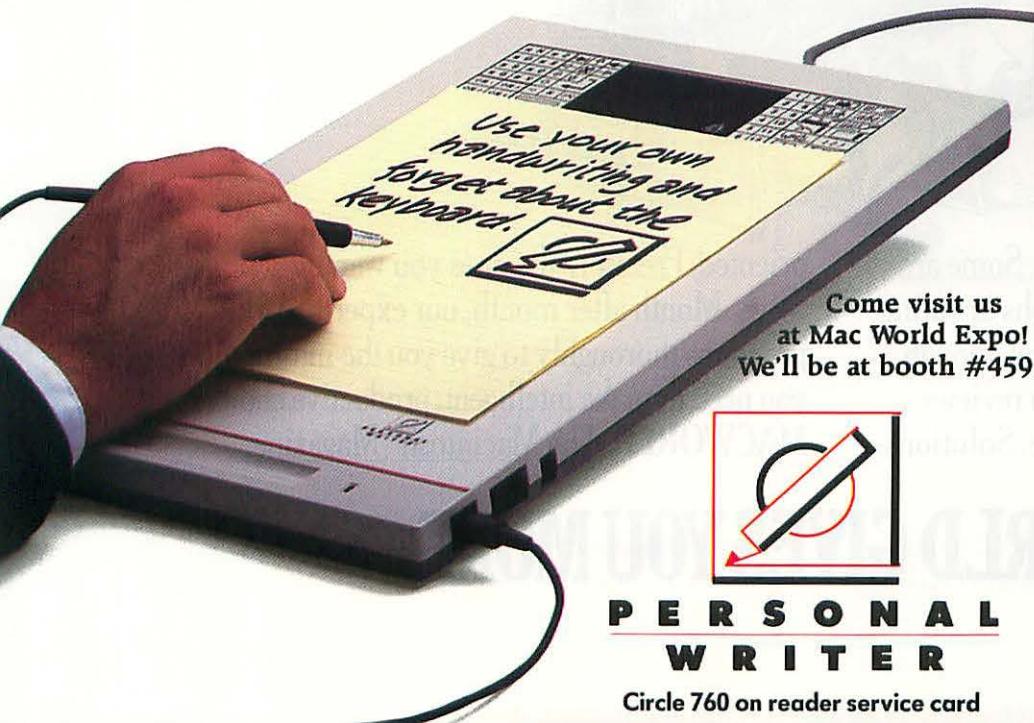
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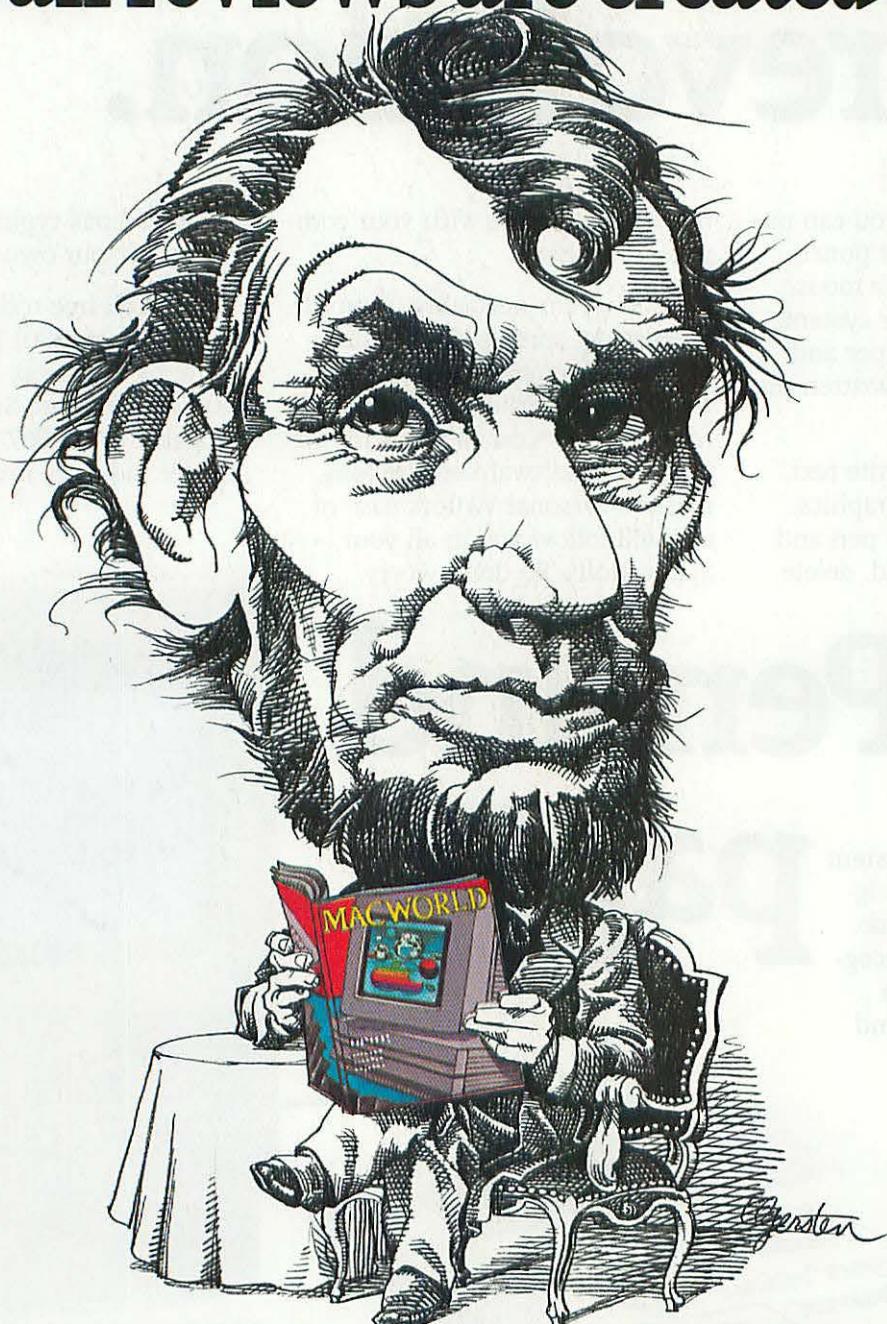
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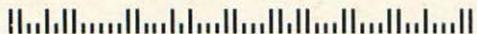
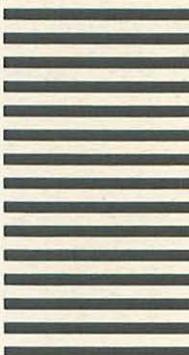
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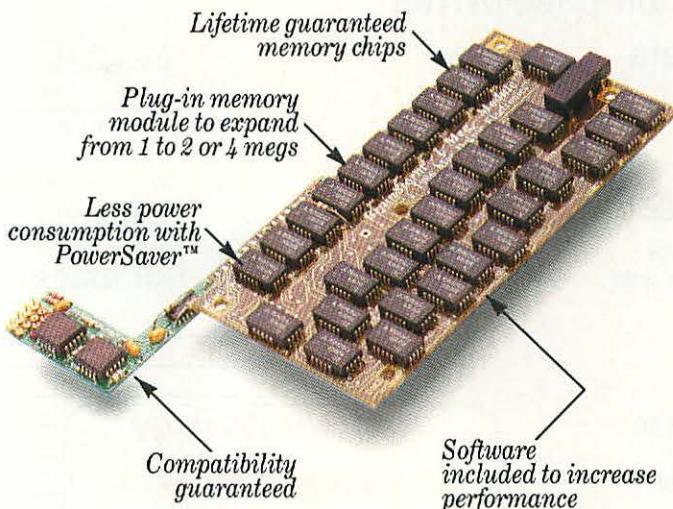
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But what really sets us apart is our user's *Guide To Increased Mac Performance*.

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able motherboard space. In fact, it's so compact that even at 4 megabytes, Brainstorm accommodates both internal hard drives



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Mac Doctor guarantees that Brainstorm will function without defect or we will repair or replace it free for one year. The memory chips are guaranteed for a lifetime – free replacement for as long as you own your Macintosh. And, you get the special guarantees of both expandability and compatibility.

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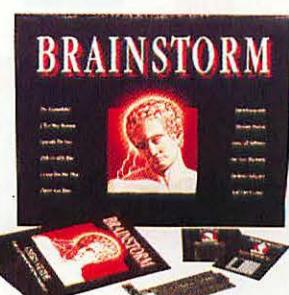
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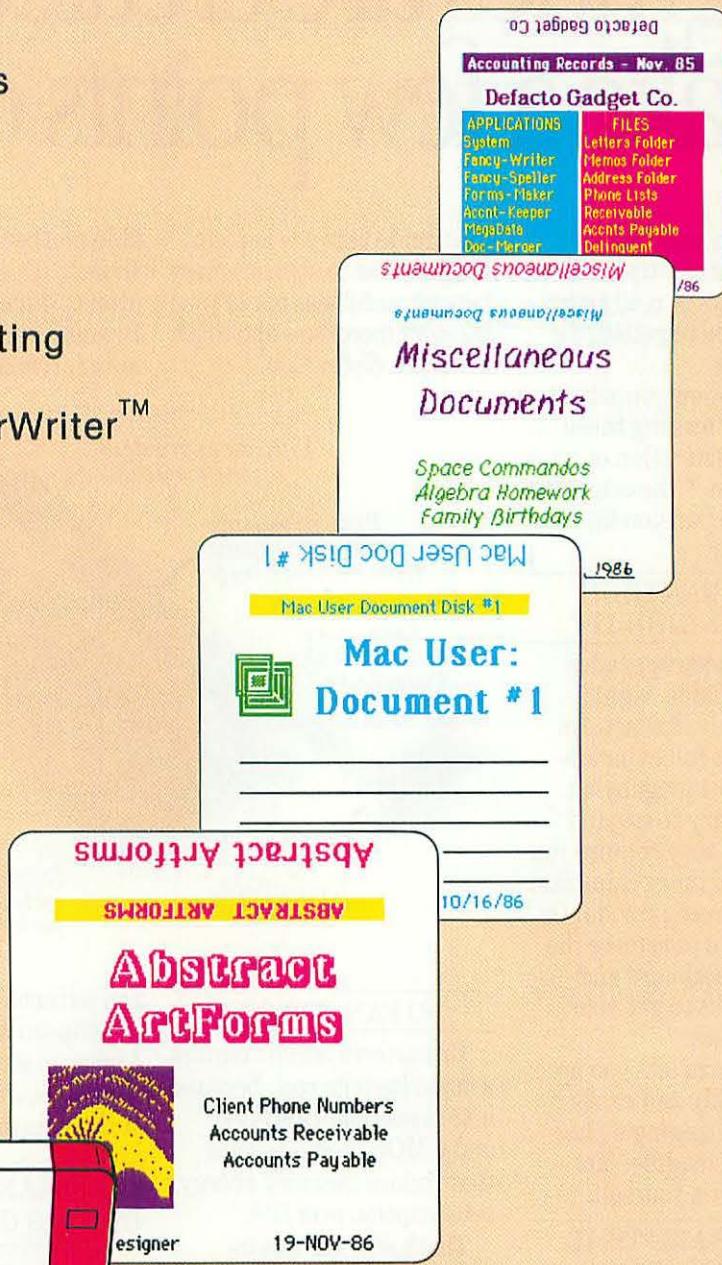
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Letters

News, even though I looked on Compu-Serve and asked around. Where should I try next?

John Cartwright
Alexandria, Virginia

You can find MacFractal on Educomp's disk number 3. Robert Eckhardt has unearthed another fractal program that's fast and fun: Robert P. Munafo's Super MandelZoom, available on Educomp's disk number 335 or on Public Domain Exchange's disk number 112. Public Domain Exchange's disk number 118 also contains other fractal programs. For the addresses of both these organizations, which distribute shareware and public domain software, look in the introduction of the Where to Buy section of Macworld. For evaluations of more programs of this ilk, see Eckhardt's 432-page book, Free (and Almost Free) Software for the Macintosh (\$19.95), due out this month from Crown.

Accounting for Taste

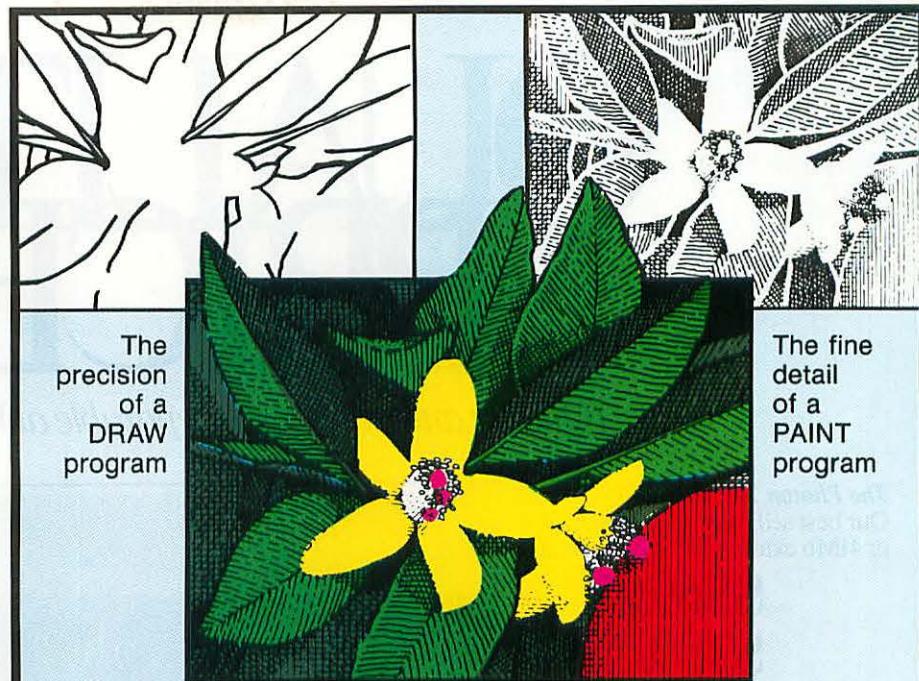
Steve Mann's review of the *Great Plains Accounting Series* [Reviews, Macworld, April 1987] was merely Mann's opinion of the Mac interface and the pricing of Great Plains' after-sale service and support. The reason Mann never once got through to the support people is that he failed to register the software. Not only do we provide the standard support services for our customers—three telephone support plans, updates, and a quarterly newsletter—we also offer other services, for example, on-site installation and customer training, chart-of-accounts proofing and setup services, workbooks of frequently asked questions, data conversion services for new versions of the software, and so on.

Great Plains is the only Mac accounting software offering a complete retail solution with point-of-sale invoicing, including the capability to use cash drawers and bar-code readers. Mann's review gave only lip service to the extensive accounting functionality of the software.

Linda Bullert,
Product Marketing Manager
Great Plains Software
Fargo, North Dakota

A short review can't list every feature of a complex series of programs like the Great Plains accounting software; in fact, the review specified that only four modules could be covered in the space allotted.

(continues)



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(compared to other paint programs) "SuperPaint is the clear winner and... MacPaint's heir apparent."

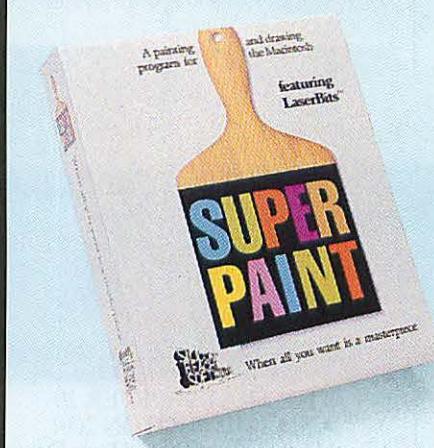
Adrian Mello, MacWorld, Jan '87

"SuperPaint is the hottest graphics package currently available."

Bob LeVitus, MACazine, Jan '87

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Sharon Aker, MacUser, Feb '87



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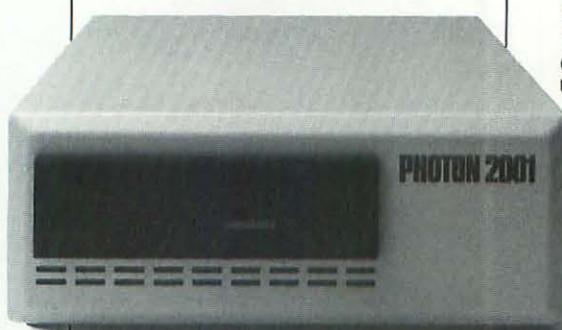
*This price includes a rebate of \$100.00 if you return the 800k floppy drive to us in our pre-supplied box. P20i, P30i, and P45i without rebate, \$599.00, \$749.00, \$999.00 respectively.



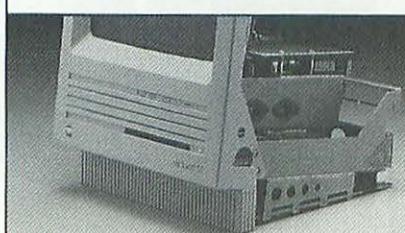
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Circle 439 on reader service card

Letters

The review did misstate the reviewer's evaluation of support: a sentence deleted in editing indicated that the Great Plains support people called back one to six hours later to answer his questions.

Mann says, "Great Plains does provide a lot of support services that many other accounting software vendors don't, but you have to pay for all of them. The services may be useful for companies that can't rely on their CPAs, accounting personnel, or competent third parties, but all the services cost premium prices, averaging \$50 per hour." —Ed.

BASIC Chart Update

Though "BASIC Choices" in the May 1987 issue was well done and accurate, there are a couple of points covered by the comparison chart that I'd like to clarify. ZBASIC does, in fact, support long integer variables and user-defined functions (both DEF FN and LONG FN/END FN for multiline functions).

Michael A. Gariepy, Chairman
Zedcor, Inc.
Tucson, Arizona

That Smarts

A year ago I ordered *MacSmarts* from Cognition Technology of Cambridge, Massachusetts. After many phone calls, I received only a prerelease version of the program, which lacked proper documentation.

L. Randall Crawford
Durham, North Carolina

We have received a number of similar complaints recently. Richard Mansfield, president of the firm, admits that customer service has been inadequate. The company had suspended shipments for several months at the beginning of the year while it upgraded the program. Mansfield says version 1.1 is now available for \$149.95 through dealers and mail-order suppliers such as Mac Connection and ComputerWare. —Ed.

Letters should be mailed to Letters, Macworld, 501 Second St., San Francisco, CA 94107, or sent electronically via MCI Mail or to CompuServe 70370,702 or The Source BCW440. Include a return address. We reserve the right to edit letters. All published letters become the property of Macworld. □

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You too can easily generate a wealth of print material with Silicon Press.

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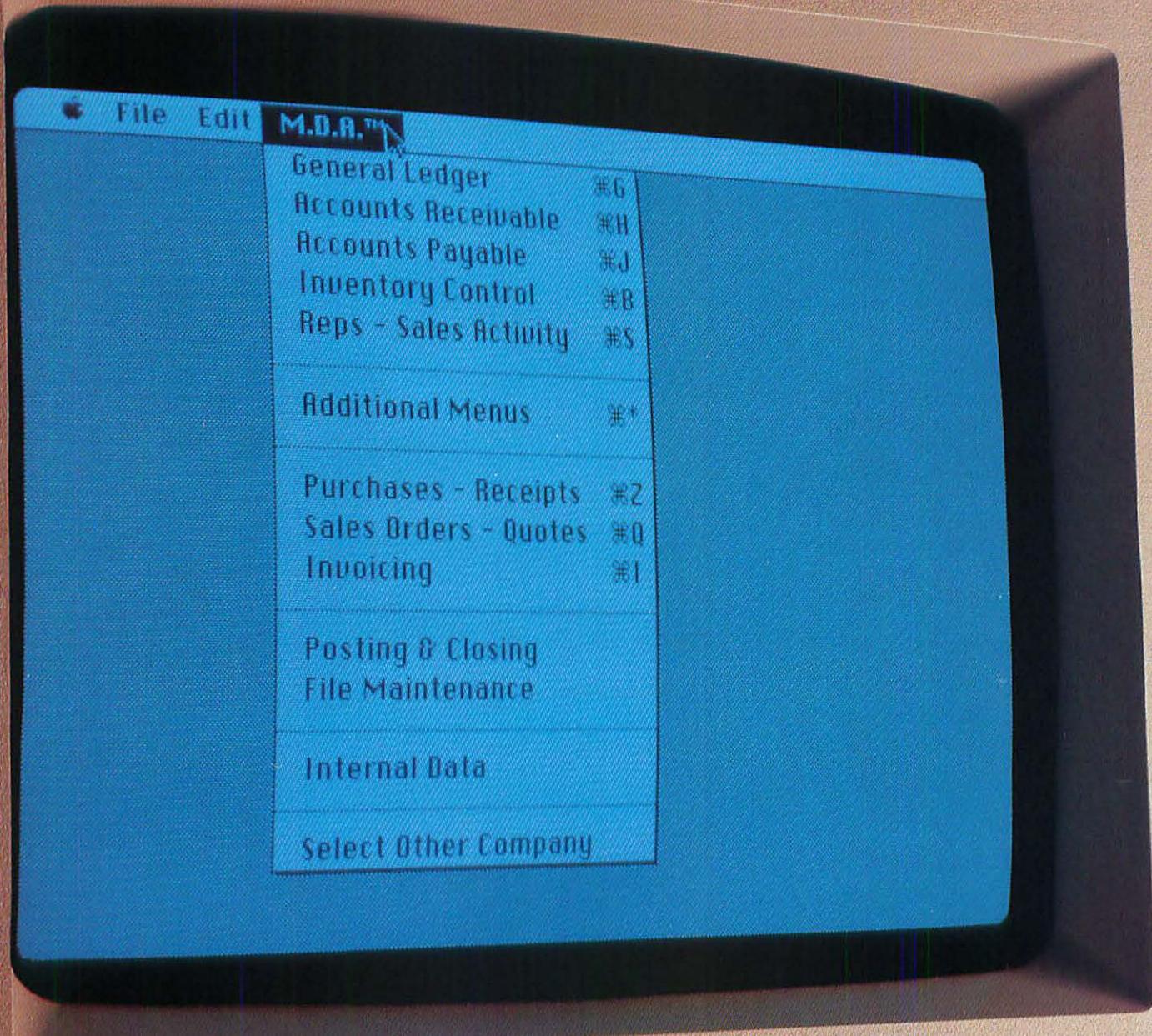
System Requirements:
Macintosh 512K, Plus, XL

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Whether your accounting department is a single desk, or several offices, MDA will fit your needs. With plenty of room for growth.

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An expandable selection of capabilities, courtesy of OMNIS 3 Plus™

MDA is a highly sophisticated accounting system. Written by accountants. For accountants. And best of all, it's written

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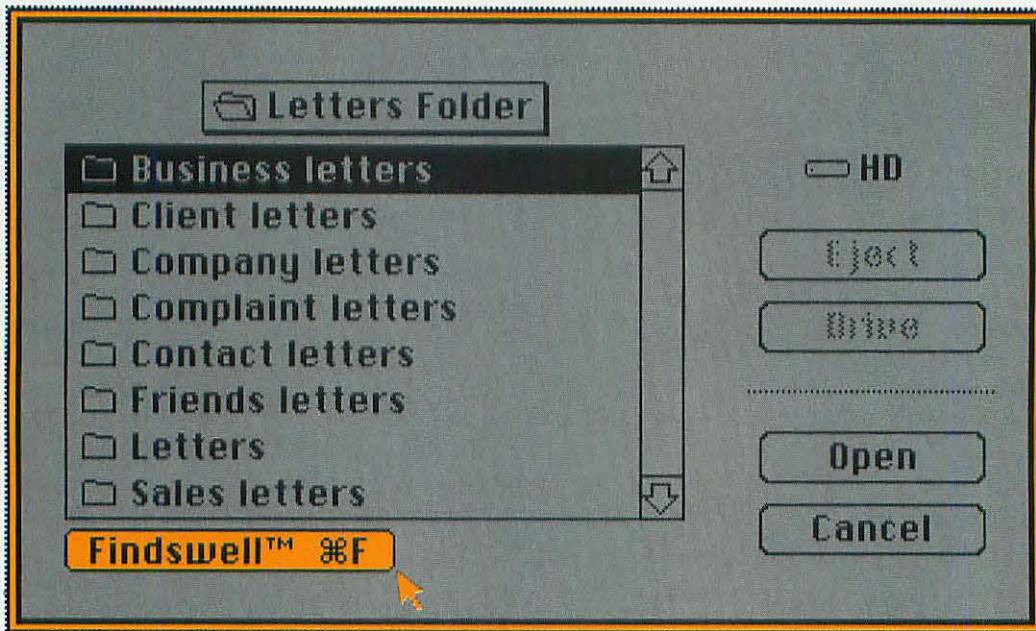
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*In its multiuser version MDA supports an accounting staff working in the same or various areas simultaneously, limited only by the database-hardware networking capabilities. © 1987 Circo Business Solutions.

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Double-click on the name or press OPEN and your document is opened and ready

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What's in a Face?

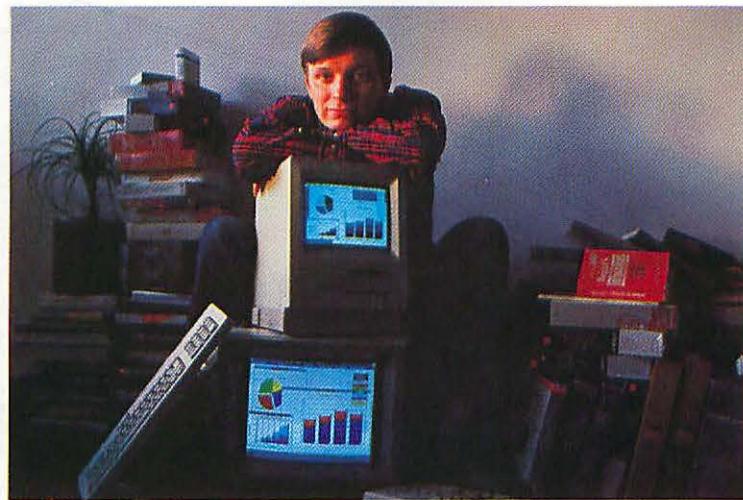
The Mac's famous interface has sold the computer to users. What's next, now that the competition has been sold on the idea?

Recently I heard an Apple spokesperson extolling the virtues of the Mac's graphical interface. The speaker was well into convincing his audience of the advantages of the windowing metaphor when it struck me that there may be people out there who aren't looking beyond the technology provided by Apple.

Windowing in a graphics environment has been around much longer than Apple Computer, but Apple succeeded wildly in popularizing windows, menus, and the mouse. Certain of its operating characteristics are innovations unique to Apple. Recognizing what came before and Apple's contribution to what has been since, we come to the present.

In the aftermath of IBM's announcement of its System 2 computers and OS/2 software (which will support windows), a pertinent question comes to mind: "So who *doesn't* use a graphical interface?" Many universities and Digital Equipment Corporation have endorsed *X-Windows*; Sun supports *News*; Apple and IBM ... well, we know them. But let's be fair. Microsoft says it won't even be shipping development tools for OS/2 before the fall of 1987. Applications won't appear before 1988. So Apple has quite a lead time to continue with its own innovations to the windowing metaphor.

Or does it? Close study of the OS/2 specifications shows that OS/2 is intended to be a real multitasking operating system. In particular it has three key features. OS/2 has the ability to schedule CPU tasks so that different applications can share the CPU (preemptive scheduling), it has communications protocols that allow background tasks to intercede with other applications (interprocess communications protocols), and finally OS/2 allocates spe-



BOB SACHA

Jim Rafferty, president of Cricket Software, is the latest Mac developer to announce his intention to branch out into producing software for the new IBM machines.

cific memory locations to different applications and then protects these locations (hardware memory allocation).

OS/2 may still be a glimmer in Bill Gates's eyes, but it is an acute glimmer. Apple, on the other hand is merely taking steps toward these advances with its new System and Finder. In fact the new System, like Andy Hertzfeld's original *Switcher*, may crash when applications "borrow" memory from one another. However, Apple believes that a gradual move to a richer multitasking environment will allow time for third-party software developers to keep up with changes to the Apple System software.

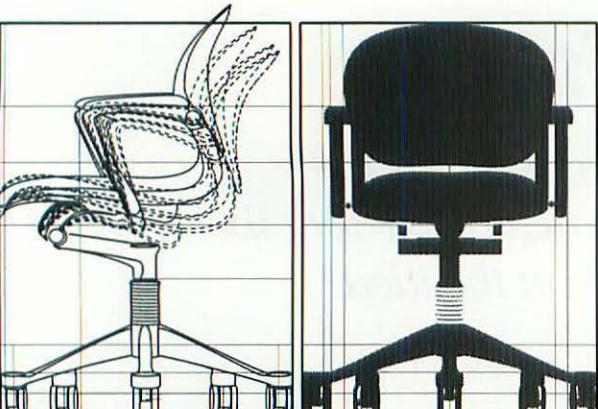
Well then, Apple has lots to do this year if it is to stay ahead of the Microsoft/IBM team. But what about applications? Surely Apple leads there? Yes, but many Apple stalwarts—Aldus, Adobe, and Cricket among them—have developed or will develop products for *Windows*. And they believe that adjusting their programs to fit OS/2 will not be a daunting task. So the applications lead may dwindle rapidly, at least for the best-selling products.

Then there's the interface itself. Earlier this year I praised the little touches—cleanup, the Trash Can, the watch hands, and so on—that changed with the SE and Mac II. But the interface is showing signs of age. There are those, including people within Apple, who believe that the interface, the company's most valuable asset, is being ignored. Some of the interface deficiencies and needed improvements are obvious: the development of a color picker, the incongruities of scroll bars for long documents, nonstandard features of different Toolbox functions (buttons, bars, and other details), the problem of stacking multiple windows, the still-primitive state of the text editor in the development tools.

Apple's crown jewels may go missing at this rate.

And there are even more troublesome interface issues that are less obvious. Some developers are implementing dialog boxes reminiscent of IBM-style programs because of the large number of file formats users

(continues)



Chair art courtesy of Apple Computer, Inc.

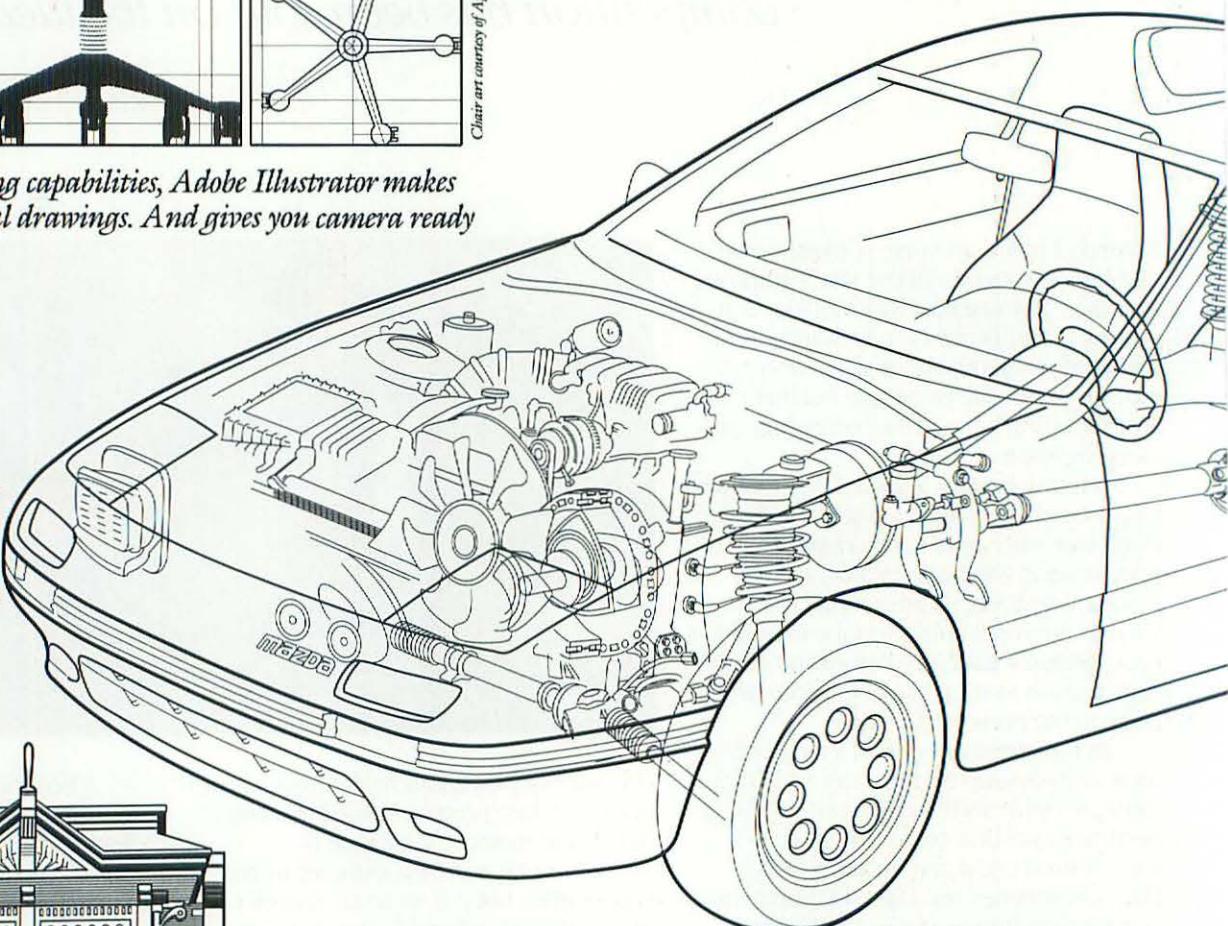
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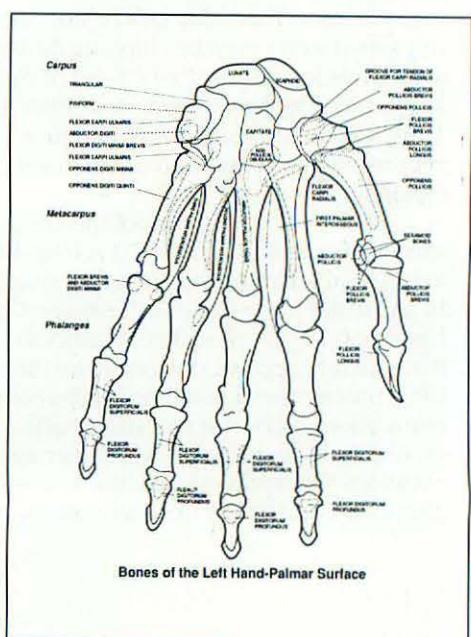


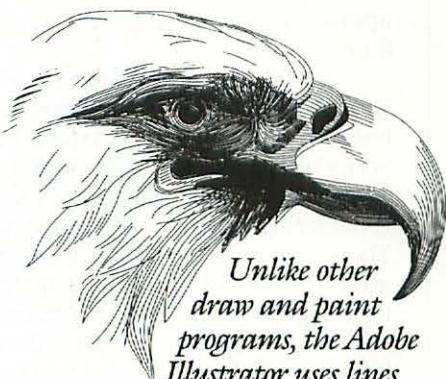
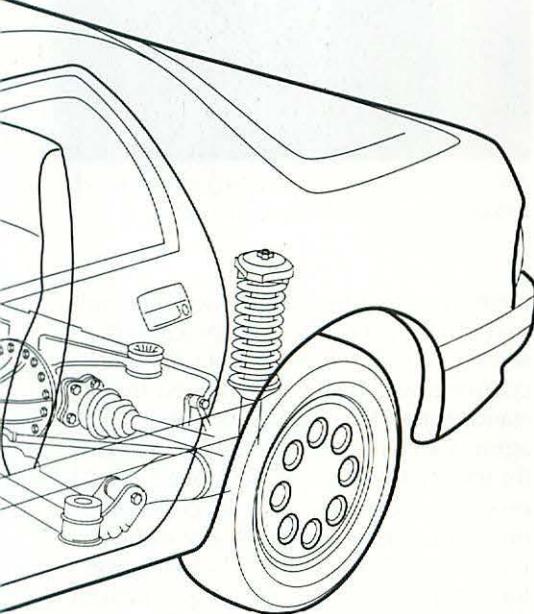
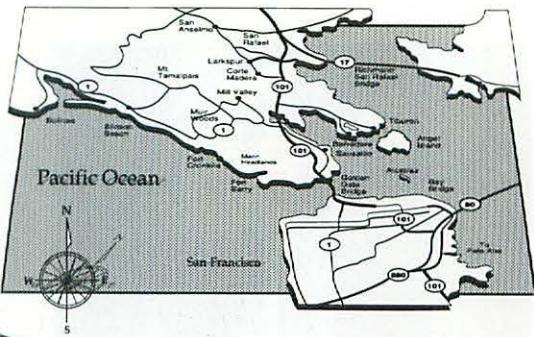
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Other draw and paint programs also let you add captions. But none of them can put those captions next to the sharpest, cleanest lines and curves on the map.





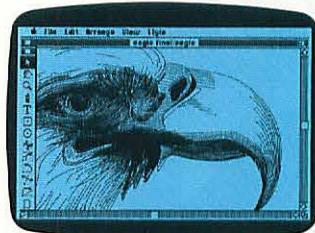
Unlike other draw and paint programs, the Adobe Illustrator uses lines

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Unlike other programs, the Adobe Illustrator doesn't build an illustration dot by dot. It uses precise *lines and curves* instead.

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Once in the computer, this scanned image becomes your guide. You trace over it to construct the new image. Then, once you have the image you want, you can manipulate it in ways possible only with a computer—scale it, rotate it, even combine it with other Adobe Illustrator images.

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Imagine, if you will, getting camera ready art out of a Macintosh. (We did. You're looking at it.)

Or being able to change that art radically—as easily as you'd edit a letter—and getting new art, literally, within minutes.

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So why don't you?

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DiskFit is automatic.

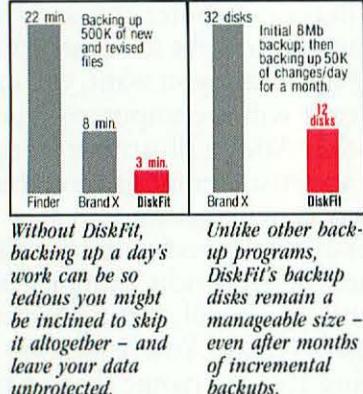
DiskFit manages the entire backup process so you don't have to. It scans your hard disk for files that need to be backed up. Then it deletes obsolete files from the backup disks and fits your new files — in standard Macintosh format — into the reclaimed space. Automatically. And DiskFit only asks for the disks it needs. DiskFit even formats your blank floppies, verifies the integrity of the backup, and generates a backup report.

DiskFit is fast. A typical day's work is backed up to floppies in just about three minutes. Backing up from one hard disk to another is even faster.

DiskFit requires fewer backup disks. Other programs are inefficient; they don't reclaim the space left by old files, so they require an ever-increasing number of disks each time you back up.

Not so with DiskFit.

It's smart, so your backup set grows only as much as your files do. And since no directory disk is required, you have nothing to lose. Even if you lose one of your backup disks, DiskFit will recreate it.



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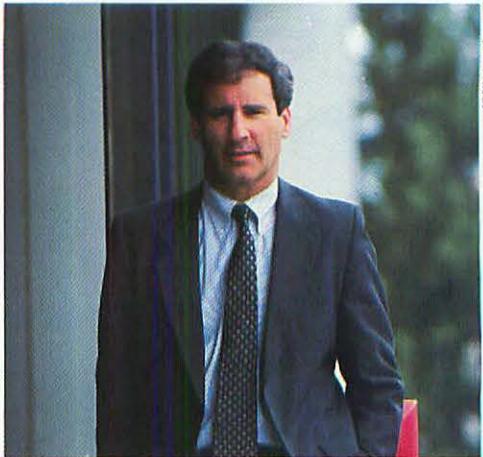


SUPERMAC
SOFTWARE

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System requirements: Macintosh 512, Plus, SE, or Macintosh II with one or more HFS-format hard disks.

AppleShare is a trademark of Apple Computer, Inc.
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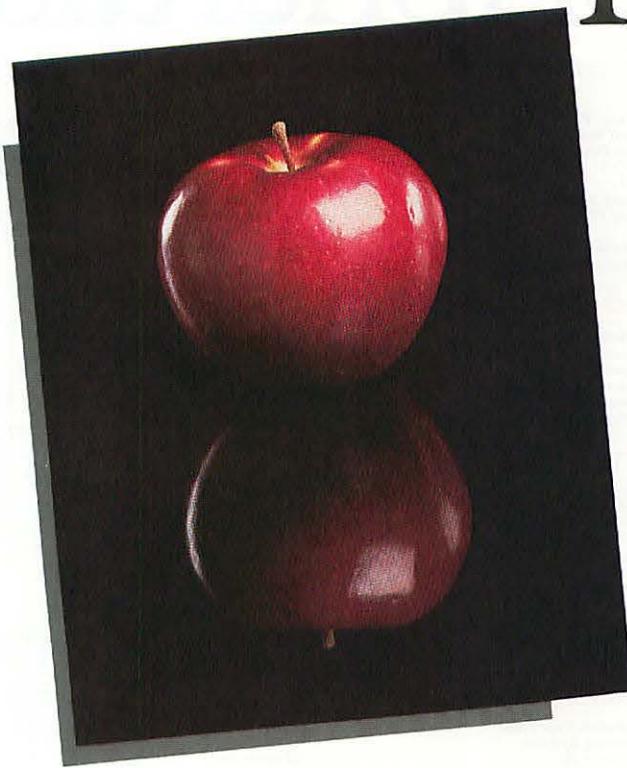
Bill Campbell, head of Apple's software spin-off, will keep Mac software a step ahead.

might require. QuickDraw, the set of built-in routines that produce graphics on the screen, is becoming the center of other controversy. QuickDraw has been an outstanding tool for programmers, but it is aging. Can QuickDraw provide a standard for interfacing with any peripheral or add-on card, so-called device independence, given the markets Apple is now addressing? Is it a robust enough model to cover forthcoming image processing and interactive graphics applications? If not, can it be upgraded soon enough to provide support for developers?

Already there's a challenger to QuickDraw; no doubt the first of many. Adobe has announced its intent to make PostScript both a page-description and a screen-display language. Should Apple be considering the same path for QuickDraw? There are developers, such as Aldus, that avoid QuickDraw and write data directly to PostScript. If many software designers follow this example, then Apple will surely lose control of technology direction, just as IBM did.

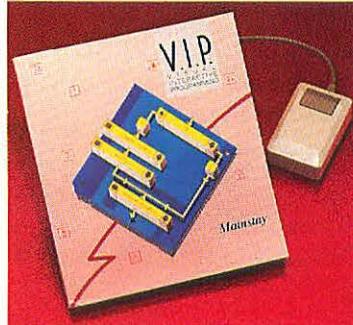
Last month in my column I asked if Apple should be in the software business. The message I hear from developers and others in the industry is yes, Apple must continue to innovate its system software. Apple has recently created a new company to market its application software. Bill Campbell, who leaves Apple to head the company, says that this is a clear statement that Apple wants to foment the growth of software for the Macintosh. Improving system software may not be as glorious a task as putting out new hardware or application software, but Apple should look twice at whether it is moving quickly enough in this area. □

Polish Up Your Mac



V.I.P. by Mainstay

Visual Interactive Programming or V.I.P. for short is a totally new type of language where a graphic interface replaces text editor. Visual programming is done by pointing, clicking and entering expressions and arguments into elements of an on-screen flowchart. Creating a V.I.P. program is simply a matter of clicking on logic form icons and procedure class icons to choose desired procedures. A V.I.P. program is composed of graphic elements which can be cut, copied, or pasted and more than 180 pre-compiled toolbox procedures are provided to greatly simplify programming. Imagine the benefits of development in a friendly, interactive environment and with a few addi-

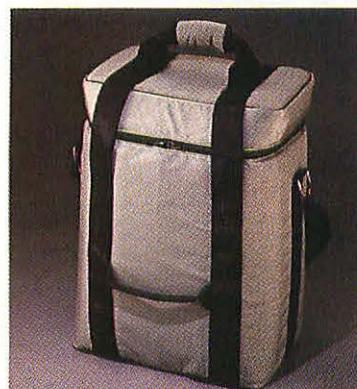


tional mouse clicks, having a ready to run, stand-alone application!

V.I.P. (Visual Interactive Programming) 85.00

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The Macinware SE carry case is designed to handle any configuration of Macintosh SE with external hard disk, external floppy disk, modem, and accessories. The inside design of the bag is broken up into padded compartments to protect each piece of equipment and a padded flap folds down over the Macintosh to accept a hard disk. This new bag's outer shell is constructed of cordura nylon with $\frac{1}{2}$ " of high density foam for protection and heavy duty nylon webbing is used throughout with all metal hardware to insure proper support. Order the Macinware SE carry case today - available in platinum color to match the Macintosh SE!



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Programs Plus

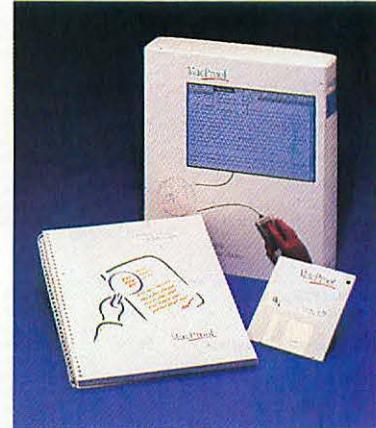
Picks of the Month with Special Pricing!

Specials Good Through August 31, 1987

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MacProof is a grammar, style and spelling checker that's like having your own personal copy editor. MacProof will work with Microsoft Word, MacWrite, or Jazz and will run in both a network and a stand-alone environment. MacProof checks for spelling, punctuation, and capitalization errors. It also checks for double words, be verbs, nominalizations, paragraph structure, sentence structure, sexist or racist words, vague and discouraged words. And, on top of all that, MacProof carries a 93,000 word dictionary that can be modified by the user. Avoid mistakes and learn to be a better writer with MacProof the most advanced electronic proofreader available!

MacProof 99.00



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The Ehman 800k *double-sided external drive* features an LED (so you know the silent drive is running!), a manual eject button, and a compact case (*available in beige or platinum*) that matches Mac aesthetics. It's compatible with old and new Mac ROMs so you can use it on a standard Mac 512k, a MacPlus, or a Mac SE. The Ehman 800k also comes with a 12 month warranty (*four times Apples!*) and offers advanced power and elegant design at the price you've been waiting for!

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External Drive 195.00



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Hard Disk Backup or Hard Disk Partition	38.00	Diskfit (Backup & Restore Utility)	49.00
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MacServe (Network Software)	165.00	LaserSpeed (Single User)	66.00
LaserServe (LaserWriter Print Spooler)	65.00	Williams & Macias	
ComServe (Modem Sharing Software)	195.00	myDiskLabeler	24.00
MacMemory, Inc.		myDiskLabeler w/ Color	33.00
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Borland Turbo Pascal	59.00	Microsoft Fortran Compiler 2.2	169.00
Consulair		Think Technologies	
Macintosh 68000 Development System	59.00	LightSpeed C	125.00
Mainstay		LightSpeed Pascal	85.00
V.I.P. (Visual Interactive Programming)	Special 85.00	TML Systems TML Pascal V2.0	68.00
Microsoft		TML Source Code Library	58.00
Microsoft Basic Interpreter 3.0	64.00	TML DataBase Toolkit	64.00
		Zedcor, Inc. ZBasic	65.00

Communications Software

Apple Computer MacTerminal	99.00	Software Ventures	
CompuServe		Microphone	58.00
CompuServe Starter Kit	24.00	Think Technologies, Inc.	
DataViz		InBox-Starter Kit V2.0 (3 Personal Connections)	239.00
MacLink Plus with Cable	149.00	InBox-Additional Personal Connections	89.00
Hayes Microcomputer Smartcom II	88.00		

DataBase Management

Ashton-Tate dBase Mac	299.00	Nantucket Corporation McMax (Run dBase Programs on the Mac)	219.00
Blythe Software Omnis 3 Plus	259.00	Odesta Double Helix	275.00
Omnis 3 Plus Multi-User (MacServe, Tops Network, Corvus, or Appleshare Network)		ProVUE Development	
499.00	OverVue 2.1	149.00	
Borland Reflex	59.00	Software Discoveries	
Foresight FileMaker Plus	159.00	RecordHolderPlus	45.00
Microsoft		MergeWrite	32.00
Microsoft File 1.04	110.00	Telos Software Business FileVision	199.00

Business Software

Apple Computer		Cricket Software	
MacProject	159.00	Cricket Graph	125.00
Batteries Included		Data Tailor	
Insur Portfolio System	129.00	Trapeze (Spreadsheet/Color Report Generator)	169.00
Time Link	34.00	Forethought PowerPoint	209.00
Bravo Technologies MacCalc	85.00		

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Layered

Notes For Excel, PageMaker, or Microsoft Works (each)	42.00	Microsoft Chart 1.0	72.00
Legisoft/Nolo Press		Satori Software	224.00
WillWriter V2.0	32.00	Legal Billing	385.00
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Micro Planning Software		Project Billing	445.00
Micro Planner Plus	299.00	Bulk Mailer	74.00
Microsoft		Bulk Mailer Plus	225.00
Microsoft Works 1.0	189.00	Target Software Memorandum (Attach Electronic Notes to Files)	62.00
Microsoft Multiplan 1.11	110.00		

Word & Outline Processors

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Apple Computer MacWrite	99.00	Guide Envelope System	99.00
Firebird Licensees Laser Author	109.00	Symmetry Acta VI.2	38.00
Living Videotext More	149.00	Target Software Voila!	62.00
Microsoft Microsoft Word 3.0	239.00	T/Maker Company WriteNow	98.00

Spelling & Grammar Checkers

Aegis Development Doug Clapp's Word Tools	45.00	Target Software Mentor (Network Compatible Spelling Checker)	62.00
Aegis Speed Speller	29.00	Mentor Plus (Includes Definitions)	119.00
Word Tools Combo Pack	65.00	Merriam Webster Thesaurus for Microsoft Word 3.0	39.00
A.L.P. Systems MacProof V2.0 (Requires MacPlus)	Special 99.00	Working Software Inc. SpellsWell Spelling Checker & Proofreader VI.3	45.00
Batteries Included Thunder! (Interactive Spelling Checker)	34.00	Medical Dictionary (35,000 Medical Terms)	65.00
Lundein & Associates WorksPlus Spell	39.00		

Desktop Publishing

Aldus Corporation PageMaker	499.00	Orange Micro, Inc. Ragtime V1.1 (Integrated Page Processing)	199.00
Boston Publishing Systems	199.00	Solutions, Inc. MacOneWrite Three Pack (GL/AR/CD)	59.00
The MacPublisher III	79.00	Sierra On-Line MacOneWrite Three Pack (GL/AR/CD)	129.00
Letraset Letra Hyphen	79.00	Survivor Software MacMoney (Financial Planner)	42.00
Letra Index	Call		
Ready, Set, Go! 3			

Accounting Packages

BPI BPI Entry Series-General Accounting	135.00	Monogram Dollars & Sense	81.00
Chang Labs New Enhanced Version III Modules!		Business Sense (GL/AR/AP)	339.00
Rags to Riches GL, AR, or AP	125.00	Palantir General Ledger or Accounts Receivable	49.00
Rags to Riches Three Pack-(GL/AR/AP)	299.00	Peachtree Back To Basics Three Pack (GL/AR/AP)	129.00
Inventory Control	243.00	Sierra On-Line MacOneWrite Three Pack (GL/AR/CD)	59.00
Professional Billing	243.00	SoftSync Accountant, Inc. Survivor Software	179.00
Professional Three Pack-(GL/Professional Billing/Payables Digital, Etc.)	349.00	MacMoney (Financial Planner)	42.00
Turbo Macaccount	259.00		

Statistics Packages

BrainPower StatView S12 Plus	179.00	Cricket Software Statworks Systat Systat (Version 3.0)	77.00
			459.00

Graphics Software

Altsys Corp. FONTastic	27.00	Miles Computing Mac The Knife Volume III, IV, or V	27.00
FONTastic Plus	49.00	Minandscape ComicWorks	48.00
Fotographer 2.2	245.00	GraphicWorks 1.1	64.00
Ann Arbor Softworks Full Paint	55.00	Silicon Beach Software	
Apple Computer MacPaint	99.00	SuperPaint	54.00
Broderbund Print Shop	39.00	Silicon Press	41.00
Toy Shop	32.00	Springboard Certificate Maker	35.00
Casadyware Fluent Fonts (Two-Disk Set)	29.00	Certificate Maker Library #1	21.00
Fluent Fonts Vol. I-15 (ea)	48.00	Symmetry PictureBase VI.2	44.00
Dubl-Click Software		T/Maker	
World Class Fonts! Vol. I or Vol. 2	28.00	Click Art Letters or Personal Graphics	28.00
World Class Fonts! (Both Volumes)	49.00	Click Art Publications or Effects	28.00
WetPaint Vol. I or Vol. 2	28.00	Click Art Letters II or Click Art Holidays	28.00
WetPaint (Both Volumes)	49.00	Click Art VideoWorks	59.00
Hayden VideoWorks	319.00	Click Art Business Image	28.00
LaserWare, Inc. LaserPaint	199.00	Click Art Laser Fonts: Plymouth, Bombay, or Seville (each)	46.00
LaserWorks			

CAD Products

Apple Computer MacDraw Challenger Software	159.00	Enabling Technologies Easy 3D Professional 3D	69.00
Mac 3D (Enhanced Version 2.0)	119.00	Innovative Data Design MacDraft (Updated Version 1.2)	199.00
Cricket Software Cricket Draw	177.00		159.00

Educational/Creative Software

Addison Wesley Puppy Love	14.00	Electronic Arts Deluxe Music Construction Set V2.0	63.00
Baudeville Ted Bear Discovers...Rainy Day Games	20.00	First Byte Kid Talk, Speller Bee, First Shapes, or Math Talk	
Guitar Wizard	20.00	MathTalk Fractions, First Letters & Words, or Smoothtalker	27.00
Broderbund Sensei Geometry Davidson & Associates	64.00		
Speed Reader II	39.00		27.00

Phenomenal Prices...

Great Wave Software	Rubicon Publishing		
KidsTime or TimeMasters	Dinner at Eight	32.00	
Concertware+ 4.0	Silver Palate Collection	28.00	
Concertware+ MIDI 4.0	Dinner at Eight-Silver Palate Bundle	54.00	
Hayden MusicWorks	Simon & Schuster		
Score Improvement System for the SAT	Typing Tutor III	35.00	
Kette Group Studio Session	Paper Airplane Construction Set	24.00	
Micro: Maps	Spinner Typing Made Easy	32.00	
MacAtlas U.S.A. or MacAtlas World	Springboard		
Mindscape Perfect Score SAT w/ The Perfect College	Early Games for Young Children	28.00	
	Easy as ABC	28.00	

Game Software

Accolade Hard Ball	Microsoft		
Activision Shanghai or Hacker II	Flight Simulator 1.0	32.00	
Hacker	Miles Computing Inc.		
Portal	Downhill Racer or Harrier Strike Mission II	27.00	
Tass Times In Tonetown	Mindscape		
Artwork Bridge 4.0	Balance of Power or Crossword Magic	32.00	
Avalon Hill Mac Pro Football	Deja Vu: A Nightmare Comes True	32.00	
Broderbund Ancient Art of War	King of Chicago or Shadowgate	32.00	
Bullseye Software	Defender of The Crown, Sinbad, or S.D.I.	32.00	
Fokker TriPlane Flight Simulator	The Uninvited	32.00	
Ferrari Grand Prix	Practical Computer Applications		
Electronic Arts Starfleet I	MacGolf 2.0 or MacRacquetball	36.00	
ChessMaster 2000	MacCourses	34.00	
Pinball Construction Set	Psion		
Patton vs Rommel or One-On-One	Psion Chess (3D & Multi-Lingual)	31.00	
Seven Cities of Gold	Sierra On-Line Space Quest	32.00	
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EPYX Winter Games or Sub Battle Simulator	King's Quest I, II, or III (each)	32.00	
Firebird Pawn	Enchanted Scepter	21.00	
Hayden Software Sargon III	Dark Castle	28.00	
Infinity Software, LTD.	World Builder	41.00	
Grand Slam Tennis	Simon & Schuster		
Infocom	Star Trek (<i>The Kobayashi Adventure</i>)	24.00	
Ballyhoo, Bureaucracy, Hitchhiker's Guide, Hollywood Hyjinx, Leather Goddesses of Phobos, Moon Mist, Stationfall, The Lurking Horror, Trinity, or Zork I (each)	Sir-Tech Mac Wizardry	35.00	
Zork Trilogy	Sphere, Inc. GATO	26.00	
Intellereations	Orbit or Falcon	26.00	
Alternate Reality/The City	SubLogic JET	35.00	
	JET Scenery Disk #7 (South East Region)	18.00	

Disk Drives/Hard Disks/Upgrades

AST Research	ProAPP 30S Hard Disk Subsystem (MacPlus SCSI)	789.00	
AST-2000	1399.00		
20-MB External Hard Disk with 20-MB Cartridge-Tape Backup for the Macintosh Plus.	ProAPP 40S Hard Disk System (Sub-30msec. Voice Coil Technology)	1239.00	
AST-4000	3699.00		
74 MB External Hard Disk with 60-MB Cartridge-Tape Backup for the Macintosh Plus.	All MacMemory products carry a full two year warranty!		
Dove Computer Corporation	MaxPlus (2MB Upgrade w/MaxRam/MaxPrint/MaxChill)	329.00	
MacSnap Model 524 (512K to 1MB Upgrade)	MaxPlus 2x4 (2.5MB Upgrade with IMB Chips-Hyperdrive Compatible)	519.00	
MacSnap Model 548 (512K to 2MB Upgrade)	MaxPack (MaxPlus and MaxSave Bundle)	379.00	
MacSnap Model 548S (512K to 2MB Upgrade w/SCSI Port)	MaxPort ("SCSI" Port for your Mac 512K)	139.00	
MacSnap Plus 2 (MacPlus to 2MB Upgrade)	Mirror Technologies	589.00	
MacSnap Plus 2H (MacPlus to 2MB Upgrade w/IMB Chips)	Magnum 800K External Drive (Available in Beige or Platinum)	209.00	
MacSnap Toolkit (Wrench, Case Cracker & Grounding Set)	Personal Computer Peripherals Available in Beige or Platinum Color	14.00	
Ehman Engineering	MacBottom HD-21 (20+Mb SCSI Hard Disk)	865.00	
Available in Beige or Platinum	MacBottom HD-32 (32Mb SCSI Hard Disk)	995.00	
Ehman 800K External Disk Drive	MacBottom HD-45 (45Mb SCSI Hard Disk)	1285.00	
Iomega Dual Cartridge Drives	MacBottom 20 (20+Mb Serial Hard Disk for Mac 512K & MacPlus)	865.00	
Bernoulli Box 2-10MB w/SCSI	Rodime Systems Rodime 20 Plus Hard Disk (MacPlus SCSI)	759.00	
Bernoulli Box 2-20MB w/SCSI	Western Automation Labs Dasch External RAMdisk (2048KB)	429.00	
10MB Cartridges (3 Pack)			
20MB Cartridges (3 Pack)			
Head Cleaning Kit			
Logic Arrays/ProAPP			
High Speed Drives with a One-Year Warranty!			
ProAPP 20S Hard Disk Subsystem (MacPlus SCSI)			

Modems

AST Research	InterBridge (Connect Appletalk Networks)	599.00	
High Quality Modems for the MacPlus, Mac SE, & Mac II	Prometheus Promodem 1200 (Hayes Compatible)	239.00	
AST-1200 (1200 Baud Modem)	Promodem 2400 (Hayes Compatible)	309.00	
AST-2400 (2400 Baud Modem)	Mac Pack w/Procom M and Cable (Specify Mac or MacPlus)	49.00	
Hayes Microcomputing	U.S. Robotics Courier 1200 (Hayes Compatible)	199.00	
Smartmodem 1200	Courier 2400 (Hayes Compatible)	359.00	
Smartmodem 1200 Mac w/Smartcom II & Cable	Courier 2400E (Hayes Compatible)	459.00	
Smartmodem 2400	Courier 9600 (Hayes Compatible)	729.00	
TransNet 1000-128K			
TransNet 1000-512K			
TransNet 1000 Mac Accessory Kit			

Blank Media

Single Sided 3 1/2" Diskettes	Sony 3 1/2" SS/DD Disks (box of 5)	14.00	
BASF 3 1/2" SS/DD Disks (box of 5)	Centech 3 1/2" SS/DD Color Disks (box of 10)	13.00	16.00

Fuji 3 1/2" SS/DD Disks (box of 10)	15.00	Centech 3 1/2" SS/DD Color Disks (box of 10)	23.00
Maxell 3 1/2" SS/DD Disks (box of 10)	14.00	Sony 3 1/2" DS/DD Disks (box of 10)	21.00
Verbatim 3 1/2" SS/DD Disks (box of 10)	15.00	Fuji 3 1/2" DS/DD Disks (box of 10)	21.00
3M 3 1/2" SS/DD Disks (box of 10)	16.00	Maxell 3 1/2" DS/DD Disks (box of 10)	21.00
C.Itoh Color Disks SS/DD (box of 10)	20.00	Verbatim 3 1/2" DS/DD Disks (box of 10)	23.00
Double Sided 3 1/2" Diskettes			
BASF 3 1/2" DS/DD Disks (box of 5)	12.00	3M 3 1/2" DS/DD Disks (box of 10)	24.00
Bulk (Sony) 3 1/2" DS/DD (10)	19.00	C.Itoh Color Disks DS/DD (box of 10)	26.00

Digitizers

AST	TurboScan (Optically Scans & Digits at 300 Dots-Per-Inch)	1399.00	New Image Technology	
Kette Group	MacNifty Audio Digitizer w/SoundCap	99.00	Magic Digitizer (Mac 128/512k or MacPlus Version)	249.00
Koala Technologies Corp.	MacVision (Digitizer)	175.00	Summagraphics MacTablet 6x9 size	289.00
			MacTablet 12x12 size	379.00
			ThunderWare	
			ThunderScans V4.0 with Power Port (Mac 512K, 512K Enhanced, MacPlus, and Macintosh SE)	199.00

Accessories

A.M. Products	External Disk Drive Cover	8.00
3 1/2" Head & Computer Cleaning Kit	ImageWriter or ImageWriter II Cover	9.00
Bech-Tech Fanny Mac	Macintosh (Plus) Dust Cover	9.00
Cambridge Automation	Mouse Cleaning Kit w/ Pocket	17.00
Numeric Turbo	Mouse Pocket	8.00
Curtis Manufacturing	Mouseway (Mousepad)	8.00
Diamond-Surge Suppressor-SP1	Polarizing Filter (Beige or Platinum)	34.00
Emerald-Surge Suppressor-SP2	Starter Pack (Includes Tilt/Swivel)	59.00
Ruby-Surge Suppressor-SPF-2	Surge Protector	34.00
Sapphire-Surge Suppressor-SPF-1	Tilt/Swivel (Beige or Platinum)	22.00
Ergotron	Control Center	64.00
MacTilt or MacTilt SE (Platinum Color)	Printer Stand	18.00
Mouse Cleaner 360	Universal Copy Stand	24.00
MacBuffer 512K	Printer Muffler 80	40.00
MacBuffer 1024K	Printer Muffler 132	55.00
Innovative Concepts	Kette Group	
Flip 'n' File/Micro	MacNifty Stereo Music System	
Flip 'n' File II/Micro	MNS-300 (Dolby, Bass, Treble)	99.00
I/O Design	MacMemory, Inc.	
Mac Luggage Available in Navy or Platinum Gray	MaxChill	
Macinware Plus Carrying Case	(Internal Piezo-Electric Fan)	
Macinware SE Carrying Case	Mousetrak MousePad 7" x 9"	8.00
Imageware II Carrying Case	MousePad 9" x 11" Size	9.00
Kalmus Designs	MPH Computer Products	
Teakwood Roll-Top Disk Cases:	MAC-B-COOL	
Micro Cabinet (holds 45 disks)	Available in Black, Blue, Brown, Green, Orange, Purple, Red, Yellow, Silver & Gold	
Double Micro Cabinet (holds 60 disks)	ImageWriter Ribbon-Black	4.50
Jumbo Micro Cabinet (holds 135 disks)	ImageWriter Ribbon-Color	5.00
Kensington	ImageWriter Rainbow Pack (6 Colors)	25.00
System Saver Mac (Beige or Platinum)	ImageWriter II Four Color Ribbon	12.00
Turbo Mouse	The Madison Line	
A/B Box (MacPlus Only)	Professional Series Carry Cases In Black Ballistic Nylon	
Disk Case (holds 36 Mac disks)	Mac(Plus) Carry Case	79.00
Disk Drive Cleaning Kit	ImageWriter I (II) Carry Case	75.00

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Signature _____

Title _____

Date _____

Please provide your business address below or affix your business card.

1. Industry (check one only)

Non-computer related businesses

- 1. Aerospace
- 2. Agriculture, mining, construction, oil
- 3. Business consulting (non-computer related)
- 4. College/university
- 5. Elementary/high school
- 6. Engineering/architecture
- 7. Finance, banking, accounting, insurance, real estate
- 8. Government
- 9. Health/medical services
- 10. Legal services
- 11. Manufacturing
- 12. Military
- 13. Other business services
- 14. Publishing/advertising/public relations
- 15. Research & development
- 16. Retail/wholesale
- 17. Transportation, communications, utilities
- 99. Other (please specify) _____

Computer-related businesses

- 18. Computer consultants
- 19. Computer retail
- 20. Distributor/wholesalers
- 21. Manufacturer (computers, software, peripherals)
- 22. Service bureau
- 23. VAR/systems house/integrator
- 99. Other (please specify) _____

2. Title (check only one)

- 1. Chairman/president/owner/partner
- 2. Vice president
- 3. Controller/treasurer/accountant
- 4. Director/supervisor/manager
- 5. Project manager/chief/group leader
- 6. Art director/writer/creative head/technical writer
- 7. Engineer/scientist
- 8. Administrator
- 9. Consultant/advisor
- 10. Microcomputer specialist/manager/analyst
- 11. Programmer
- 12. Educator
- 13. Professional (lawyer, doctor, etc.)
- 99. Other (please specify) _____

3. Department or function (check only one)

- 1. Accounting/finance
- 2. Administration/management/personnel
- 3. Consulting
- 4. Education/training
- 5. Engineering/R&D
- 6. Manufacturing/production
- 7. Microcomputer center/office automation
- 8. MIS/DP
- 9. Purchasing
- 10. Sales/marketing/distribution
- 99. Other (please specify) _____

4a. Does your company own or lease any mainframe computers at this location?

Yes No

- | | Existing
(quantity) | Plan to buy
(quantity) |
|--|------------------------|---------------------------|
| <input type="checkbox"/> 1. IBM | _____ | _____ |
| <input type="checkbox"/> 99. Other (specify) | _____ | _____ |

4b. Does your company own or lease any minicomputers at this location?

Yes No

- | | Existing
(quantity) | Plan to buy
(quantity) |
|--|------------------------|---------------------------|
| <input type="checkbox"/> 1. IBM | _____ | _____ |
| <input type="checkbox"/> 2. DEC | _____ | _____ |
| <input type="checkbox"/> 3. Sun/Apollo | _____ | _____ |
| <input type="checkbox"/> 99. Other (specify) | _____ | _____ |

Please provide your business address below or affix your business card.

NAME			
TITLE			
COMPANY/DIVISION			
MAIL STOP			
STREET			
CITY/STATE/ZIP			
BUSINESS TELEPHONE			

5. Does your firm have or plan to buy any of the following types of personal computers or microcomputer systems at your location?

Yes (indicate quantity below) No

Manufacturer	Currently own (quantity)	Plan to buy within 1-12mos	Plan to buy within 13-24mos
<input type="checkbox"/> 1. Macintosh 128/512	_____	_____	_____
<input type="checkbox"/> 2. Macintosh Plus	_____	_____	_____
<input type="checkbox"/> 3. Macintosh SE	_____	_____	_____
<input type="checkbox"/> 4. Macintosh II	_____	_____	_____
<input type="checkbox"/> 5. Apple IIe/IIc/IIgs	_____	_____	_____
<input type="checkbox"/> 6. IBM Compatible (Compaq, Tandy, etc.)	_____	_____	_____
<input type="checkbox"/> 7. IBM PC/XT/AT/RT	_____	_____	_____
<input type="checkbox"/> 8. IBM Personal System/2	_____	_____	_____
<input type="checkbox"/> 9. Sun/Apollo workstation	_____	_____	_____
<input type="checkbox"/> 99. Other scientific or engineering workstations (non-mini)	_____	_____	_____

6a. Please indicate your involvement with each of the following types of personal computers or microcomputer systems (check all that apply):

Networks &
Macintosh Micros Software Peripherals

- 1. Approve purchase
- 2. Develop/manufacture
- 3. Evaluate/select vendor
- 4. Own (at least one)
- 5. Own (two or more)
- 6. Purchase or acquire
- 7. Establish specifications
- 8. Recommend to others
- 9. Sell
- 10. Train people to use/or provide support
- 11. Use
- 12. No involvement
- 99. Other (please describe by name and quantity)

If you have no involvement with any of the above, skip to question 8.

6b. For approximately how many total personal computers or microcomputer systems do you have the above involvement? (check only one)

- A.1-3 B. 4-9 C. 10-19 D. 20-49
- E. 50-99 F. 100-499 G. 500+

7. For approximately how many Macintosh personal computers do you have involvement described in question 6 above? (check only one)

- A.1-3 B. 4-9 C. 10-19 D. 20-49
- E. 50-99 F. 100-499 G. 500+

(Over please, additional questions on reverse side)

8a. How many people work at your location? (check only one)

- A.1-9 F. 1000-2499
 B. 10-24 G. 2500-4999
 C. 25-99 H. 5000-9999
 D. 100-499 I. 10,000 or more
 E. 500-999

8b. How many people are employed by your entire company? (check only one)

- A. 1-9 F. 1000-2499
 B. 10-24 G. 2500-4999
 C. 25-99 H. 5000-9999
 D. 100-499 I. 10,000 or more
 E. 500-999

9. What percentage of people who work at your location actually use a personal computer (check only one)

- A. 1-24% D. 75%-100%
 B. 25%-49% E. None
 C. 50%-74%

10. The personal computer purchased for this location would be: (check all that apply):

1. for internal use 2. for resale
 99. other (please specify)

11. How are personal computers normally obtained for this location? (check all that apply)

1. direct from manufacturer
 2. manufacturer's representative
 3. distributor or wholesaler
 4. retail computer store
 5. mail order
 6. VAR/systems house
 7. in-house (company or university store)
 99. other (please specify)

12. Personal computers or microcomputer systems at your location are or soon will be used for the following communications activities: (check all that apply)

1. Communicate with internal company mainframe or mini
 2. Communicate with other micros via modem
 3. Communicate with outside mainframe or mini through service bureau, database or time-sharing service
 4. Local area network
 5. Voice/data
 6. None of the above
 99. Other (please describe)

13. Are you involved in any of the areas shown below?

- Yes (check all that apply) No
 A. Recommend B. Influence C. Specify D. Buy
(check all that define your involvement)

Software

1. spreadsheets
 2. word processors/outline processors
 3. database management
 4. accounting
 5. statistics
 6. communications/networking
 7. graphics
 8. presentation
 9. project management
 10. desktop publishing
 11. CAD/CAM
 12. programming language
 13. back-up systems
 14. utilities
 15. other _____

Peripherals

23. dot matrix printers
 24. letter quality printers
 25. plotter
 26. laser printer
 27. local area network
 28. file server
 29. optical disk
 30. monochrome monitor
 31. color monitor (standard)
 32. hi-res color monitor
 33. add-on board
 34. external hard disk
 35. internal hard disk
 36. back-up systems
 37. modem
 38. other _____

Computers

16. personal computers
 17. multiuser micro-computers
 18. laptop microcomputers
 19. portable microcomputers
 20. engineering workstation
 21. minicomputers
 22. mainframe computers
 23. others _____

Outside services

39. on-line services
 40. education/training
 41. maintenance
 42. custom application
 43. service bureau
 44. other _____

14. Over the course of one year, how would you quantify your level of involvement in total microcomputer systems products?

- A. Recommend B. Influence C. Specify D. Buy
(please check all that define your involvement)

1. less than \$10,000 5. \$100,000-\$249,999
 2. \$10,000-\$24,999 6. \$250,000-\$499,999
 3. \$25,000-\$49,999 7. \$500,000 +
 4. \$50,000-\$99,999 8. None of the above
(check only one)

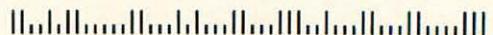


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Contributors Notes

Robert C. Eckhardt ("*Insights on More*") is a frequent Macworld contributor and author of the forthcoming books *Free* (and Almost Free) Software for the Macintosh, to be published by Crown, and *The Fully Powered Macintosh*, to be published by Brady.

Jim Heid ("*Getting Started with Graphics*") is a contributing editor of Macworld. He has been writing about the Macintosh since its introduction, and has recently completed his second Macintosh book, *dBase Mac in Business*, due out this year from Ashton-Tate Publishing. Each month he turns his attention to a different topic in his Macworld column on Mac fundamentals.

Rick LePage ("*The Road to MS-DOS*") has been writing about personal computers and telecommunications for six years. His interest in the Mac began with an Apple Lisa that landed on his desk for an extended trial. For almost two years he was an editor of the MacInTouch newsletter, which he cofounded.

Steven Levy ("*Ask Dr. Upgrade*"), whose column appears each month in Macworld, is the author of *Hackers: Heroes of the Computer Revolution*, now published in paperback by Dell.

Erfert Nielson ("*A DA in the Life*" and "*MacGraphics Tools*") was a founding member of the Macworld staff. When she's not pursuing her special interest in Macintosh graphics or hunting up an even wackier DA than Talking Moose, she may be chasing yetis in the Sierra foothills or riding the rails in the wilds of the American Midwest.

Lon Poole ("*Safety Net for Storage*") has been educating Macintosh users since the machine was introduced. Every month he answers readers' questions in his Quick Tips column. His books include *Mac Insights*, a collection of tips published this year by Microsoft Press.

David Simerly ("*A DA in the Life*") is a desk accessory junkie and author of *Practical AppleWorks Uses* and *Advanced Excel Solutions*, both from Sybex Computer Books.

Suzanne Stefanac ("*First Edition*") is a San Francisco journalist who, as West Coast editor of the East Village Eye, associate editor of Another Room Magazine, and media liaison for the No More Censorship Defense Fund, has watched numerous desktop publications go to press.

Christopher Yavelow ("*Top of the Charts*") is a computer-assisted composer who has studied music at Boston University and Harvard—and abroad, at the Franz Liszt Academy, the Darius Milhaud Conservatory, and the American Conservatory at Fontainebleau. He has received dozens of awards and fellowships for composing. His current work includes music for film and video as well as opera. □

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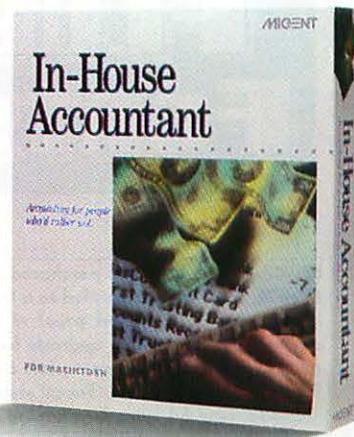
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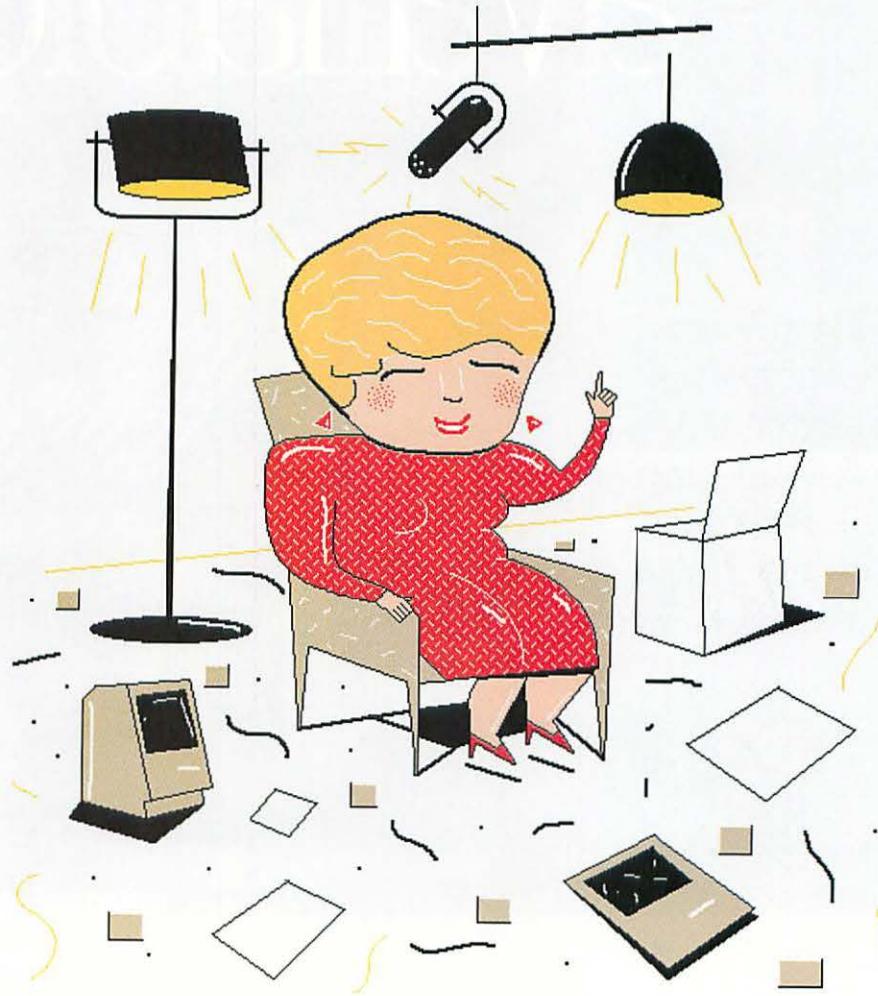
In the past, when readers have asked me about the costly and mysterious process of upgrading their Macintosh computers, I have deferred to the expert, who is of course the nationally renowned Dr. Upgrade. I simply suggested that they tune in to her cable television show, "Ask Dr. Upgrade." However, some readers have pointed out that the show is not carried in all parts of the country. I do understand that in many of those deprived areas, enterprising local independent stations are negotiating for the air rights. Alas, it will be months before this vital public service is available to all. So in the spirit of edification and education, I have arranged to print a transcript of a recent program. The opinions expressed here, of course, are not those of *Macworld*, this columnist, or any persons living or dead, except coincidentally.

OPENING THEME: Sam Cooke's "A Change Is Gonna Come."

CREDITS: "Ask Dr. Upgrade" with DR. UPGRADE and her co-host STEVE JUBBS. Sponsored by Brainstorm, Dove, Levco, MacMemory, and SuperMac.

The set resembles a cozy living room, except for the litter of computer boxes and disassembled Macintoshes. Sitting on a Balans chair is DR. UPGRADE, a feisty-looking woman who seems a cross between Joyce Brothers, Linda Hunt, and Grace Hopper. The cohost is a trim young man with dark hair and a reedy smile.

JUBBS: Well, Dr. Upgrade, we have a full hour coming up. Plenty of curiosity about the new Macintoshes, especially the SE, which lots of viewers want to upgrade to. They're in for a surprise. And we also have our usual assortment of upgrade questions from your fans. By the way, did you know that all SEs have fans?



DR. UPGRADE: Nowww, Steve, don't start with that! Fans are a verrrrry important part of many upgrades! Sometimes when people upgrade, things can get hot. Very hot! And they need fans to, you know, cool off! Hee-hee!

JUBBS: Maybe we'd better go to the phones.

DR. UPGRADE: This is Doctor Upgrade! Go ahead!

VOICE ON PHONE: This is Phil from Petaluma, California. I have a Macintosh 512 and ...

DR. UPGRADE: Before you go any farther, dear, tell me—is it a 512 or a 512 E? This is very important.

PHIL: Uh, I'm not sure.

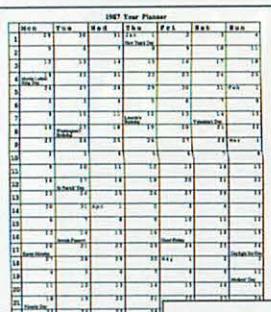
DR. UPGRADE: Look at the label on the back. Does it say 512 E? It doesn't? Then you have a 512K, unenhanced. Now ask your upgrade question.

PHIL: I just want to know whether to upgrade.

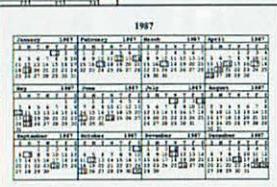
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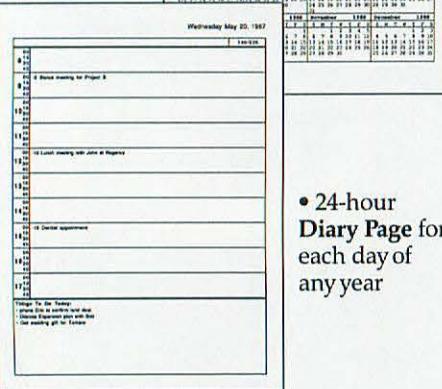
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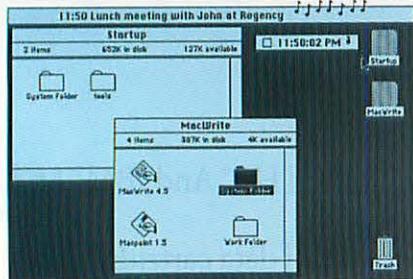


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DR. UPGRADE: OK! Now listen carefully. There are two important upgrades you can get with a 512K Macintosh that is unenhanced. Steve, can you explain briefly what *unenhanced* means?

JUBBS: That's any computer with the original 64K ROM. Before 1986. When I still was—

DR. UPGRADE: Thank you, Steve. Now, the first upgrade is called—this is very important—a *ROM upgrade*. This does two things. First, it gives you a chip with the newer ROMs—they are twice as big and make the computer go faster. Second, a ROM upgrade replaces your internal floppy disk drive with a new one that holds twice as much information on the disks. I recommend this upgrade! You will have 800K on a disk, which many new programs seem to require now, and you will see an improvement in speed. And it only costs \$300, plus a slight installation fee. So do this—go to your computer dealer and tell him to put in the *ROM upgrade!* OK?

PHIL: You mentioned a second upgrade?

DR. UPGRADE: Yes! First let me ask you, Phil. Are you a heavy-duty user?

PHIL: Mainly I do word processing and a little *Excel*.

DR. UPGRADE: I see. Well, Phil, maybe you do not need the second upgrade. This is the logic board upgrade to a Mac Plus. It doubles the memory of the computer and gives you what is called a SCSI port. If you do not want a hard disk drive, you do not need the SCSI port. And if you are happy with the programs you use, and do not need to load several at once, then say to yourself, "Who cares what other people do? I do not need this second upgrade."

But I know there are other people out there who want this second upgrade. They like to load two or three big programs into the *Switcher*, and they want a SCSI port for a hard disk drive. And this is what I tell them. Get the second upgrade! But remember, you do not have to go to Apple for this upgrade. Apple will charge you \$600, and the dealer charges more to install it. There are other companies that charge much less for the same thing.

For instance, if you want memory, you can upgrade from 512K to 1 megabyte for \$300 or under. Dove, MacMemory, Brainstorm, Levco, and SuperMac Technology all have these upgrades. The dealer will install it.

Also, for a couple hundred dollars or so more, you can upgrade to 2 megabytes. This sounds like a lot, but I guarantee that

in a year we will see bigger programs, and you will like having more memory. Just look at a copy of any of the computer magazines—have you heard of *Macworld*?—and there are plenty of companies that give you memory upgrades, cheaper than Apple. Make sure they are guaranteed, and you will not have a problem.

Apple also offers a keyboard upgrade, a simple purchase of the Macintosh Plus keyboard, for \$129. This is strictly optional! If you truly desire a numeric keypad and cursor keys, you might consider spending this money. But remember, the new keyboard will not fit in your present carrying case.

Now, as far as a SCSI port is concerned, Dr. Upgrade recommends it to those who are buying their first hard drive. SCSI drives are faster and often less expensive than serial drives. Again, you do not have to go to Apple for this upgrade. Did you know that many companies that sell hard drives will also sell you a SCSI port? For instance, SuperMac was recently selling SCSI ports for \$49 to people who bought SuperMac hard disk drives. But no matter where you buy, remember—you should not pay much more than \$100 for a SCSI port.

PHIL: Well, I do want a hard disk. But a friend told me that I couldn't get this SCSI port unless I went up to a megabyte of memory.

DR. UPGRADE: Well, I'm sure your friend meant well. But this is wrong. Having a SCSI port is OK even if you have only a 512K Mac. You do not need a megabyte of memory to install a SCSI port. So, you are going to get a ROM upgrade from Apple, and a SCSI port for under \$100 when you get your hard disk. And later, if you want more memory you can do that! OK?

I see we have another call.

VOICE: This is Diane from Wilmington, North Carolina. I did get the ROM upgrade. Now I can format a double-sided disk in my internal drive. But when I insert these disks in my old external drive, my Mac tells me that this isn't a Macintosh disk and asks me if I want it formatted. Once I pushed the wrong button and erased a whole disk! Can I upgrade my single-sided external drive to a double-sided one? Or do I have to buy a new one? And what should I do then with my old one?

DR. UPGRADE: Diane, do not feel bad about this problem. Many, many people have asked this question. And I am sorry to

(continues)

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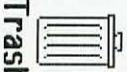
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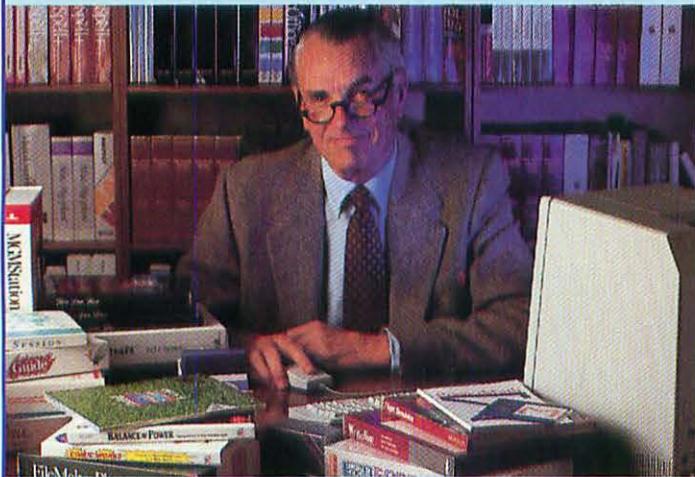
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say that, no, Apple will not upgrade external drives. You have to buy a new drive to use those double-sided disks. This costs between \$200 and \$400. If you can get by without using the double-sided disks on your external drive, there is nothing wrong, but be careful. You read the dialog boxes, don't you?

DIANE: Always. Except that one time.

DR. UPGRADE: Good for you! But some people are not so careful, and they should get another double-sided drive right away. As to what you can then do with the single-sided one, this is a real problem. You can sell it, but the person you sell it to will soon learn about upgrades, and then they will be mad at you for selling them something they shouldn't have bought. I suggest this—pack up the disk drive, mail it to John Sculley, Chairman of the Board of Apple Computer, and tell him that his upgrade policy makes this piece of equipment obsolete. So he might as well take it back. Tell him nicely! OK?

This is Doctor Upgrade! Go ahead!

VOICE: Gerald, from Austin, Texas. I have a Macintosh 128K. And I'm having trouble getting an upgrade.

DR. UPGRADE: (*Sound very concerned*) Yes. Now this is a real problem. People with these computers must get an upgrade! No one should have a computer with only 128K!

JUBBS: Well, there's a reason why the memory started out that way...

DR. UPGRADE: But there is no reason now. Most new Macintosh programs will not even run on these 128K computers! You see? But when owners of these computers go to the store to buy a third-party upgrade to 512K, no one will sell them one. Many of the companies that once offered upgrades from 128K to 512K do not sell these products anymore. The profit margin is too low. And these days, people have difficulty finding upgrades from 128K to any larger memory configuration. Even Apple, which used to sell 128K to 512K upgrades for \$449—too much to pay—has phased out those upgrades! Apple offers its 128K users an upgrade to the Mac Plus, but this is very, very expensive—almost as much as buying a new computer!

This is a verrrry serious problem. And it will not get better. So before you are totally ignored by the industry, you must find an upgrade! You must either spend a lot of money for the Apple upgrade, or you must

(continues)

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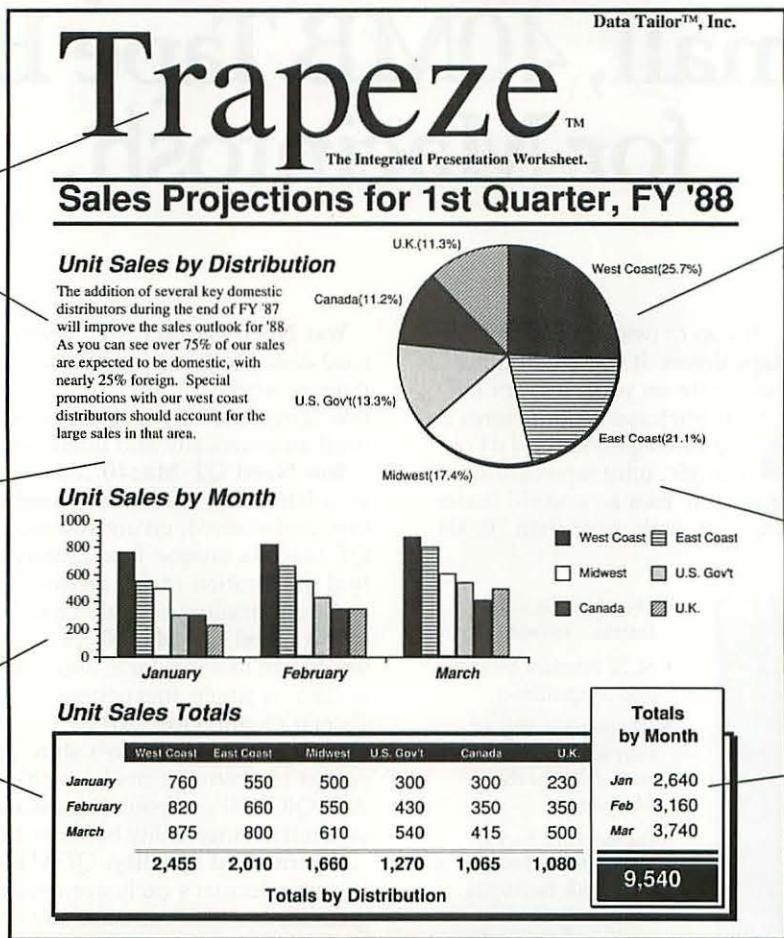
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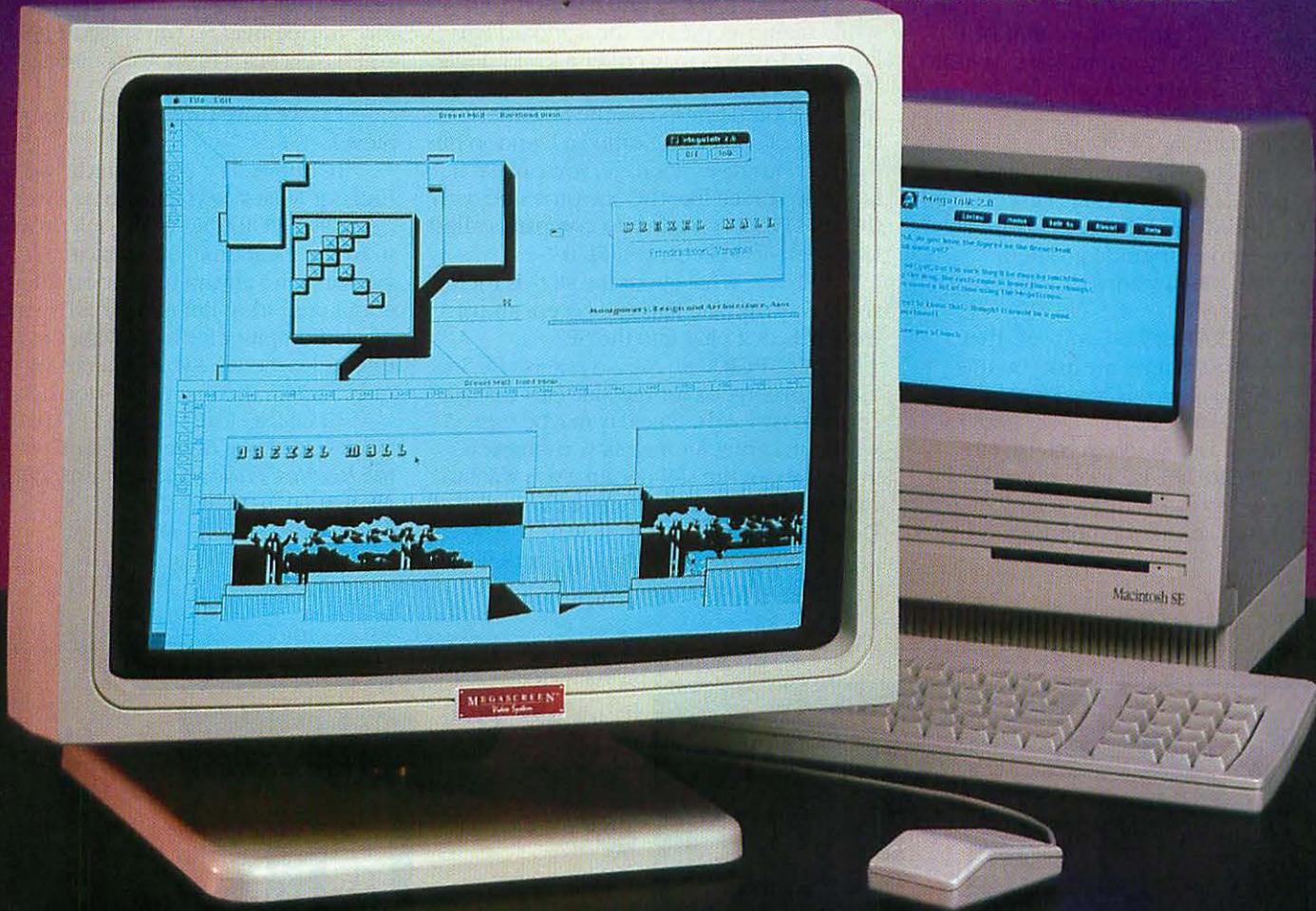
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Circle 235 on reader service card

Steven Levy

use one of many little companies all over the country that do upgrades. Most are reliable, some are not. You must check them out! Go to your local user group and find out which ones do good work. Make sure you get a guarantee! Then go and get the upgrade. You should not pay much more than \$200 to upgrade your 128K to a 512K, and then you will be in the same spot as Phil, our caller with the unenhanced 512K Mac, when you want to do another upgrade.

So do that! OK? Next call!

VOICE: This is Lenny from Brooklyn. I'm the proud owner of a Mac Plus.

DR. UPGRADE: Very good, Lenny! Now what is your upgrade problem?

LENNY: Well, I want to know how to upgrade to an SE.

DR. UPGRADE: Well, you see, that cannot be done. But let me ask you this, Lenny—do you like your Mac Plus?

LENNY: I do, but ...

JUBBS: It is insanely great, isn't it?

DR. UPGRADE: Insanely great! Ho ha ha ha. Steve, you are a funny young man! But let me tell Lenny—do not despair that

you cannot upgrade. Your Mac Plus can do everything an SE can! But maybe a bit slower. Understand? If you'd like a hard disk drive, you can have that! Even an internal one, like you can buy on an SE!

LENNY: And what about an SE keyboard?

DR. UPGRADE: I understand that while many people like the standard Plus keyboard, others may prefer a lower angle. It takes all kinds! While you cannot get either keyboard offered on the Macintosh SE, because of something called a Desktop Bus that the Plus does not have, you can get a keyboard much like the one provided with the IBM PC. It is made by a company called Datadesk. It will cost you \$170.

LENNY: What about the slot? Is there some way my Mac Plus can accept any of the cards that plug into the SE?

DR. UPGRADE: No. No one is offering an expansion box for the Mac Plus that accepts those cards. One day maybe they will. But, Lenny, let me ask you—are you asking about the slot because you want to expand to a 68020 coprocessor board? Don't be shy!

LENNY: Yes, Dr. Upgrade, that's it. I ... I like speed.

DR. UPGRADE: That's nothing to be ashamed of! Let me tell you what you can do. You can upgrade your Plus with an expansion board, just like you can with the SE. For instance, Radius will sell you a 68020 board that goes in your Plus and accepts an optional coprocessor chip. It makes your Mac Plus run even faster than a Mac II! Hee-hee! So you see, just because you have a Mac Plus doesn't mean you cannot have speed.

Do we have time for another question, Steve?

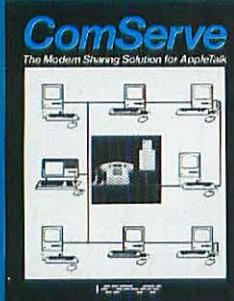
JUBBS: Sorry, Dr. Upgrade, we won't find out what's next for at least a week.

DR. UPGRADE: We'll look forward to it. In the meantime, I want to thank my viewers who always have good questions about upgrades. But most of all, thanks to Apple Computer for improving the Macintosh at least once a year and raising these questions in the first place. Hee-hee!

CLOSING CREDITS AND THEME

SONG: "Getting Better (All the Time)," by the Beatles. *Fade to a Happy Macintosh screenshot.* □

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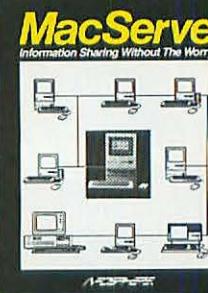
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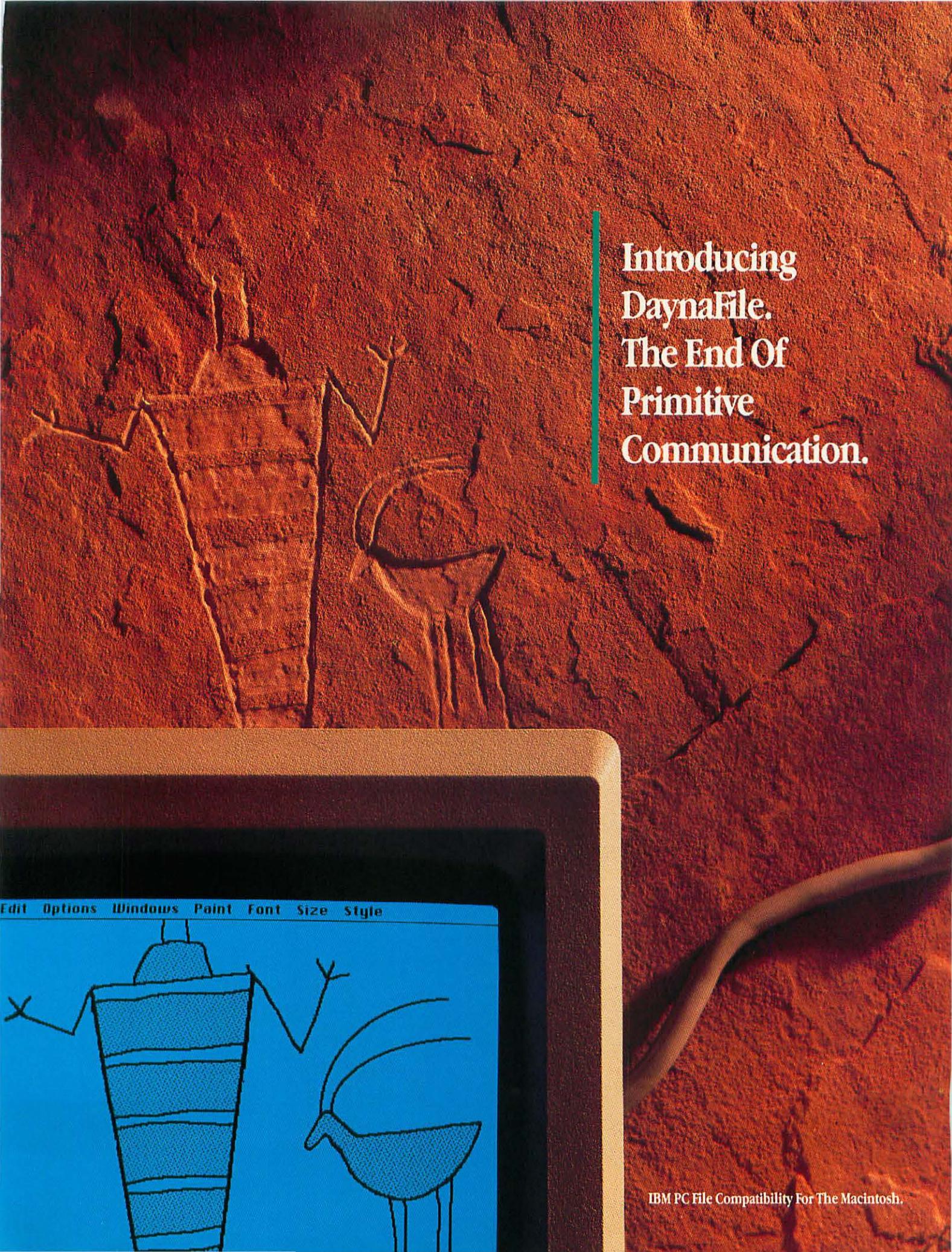
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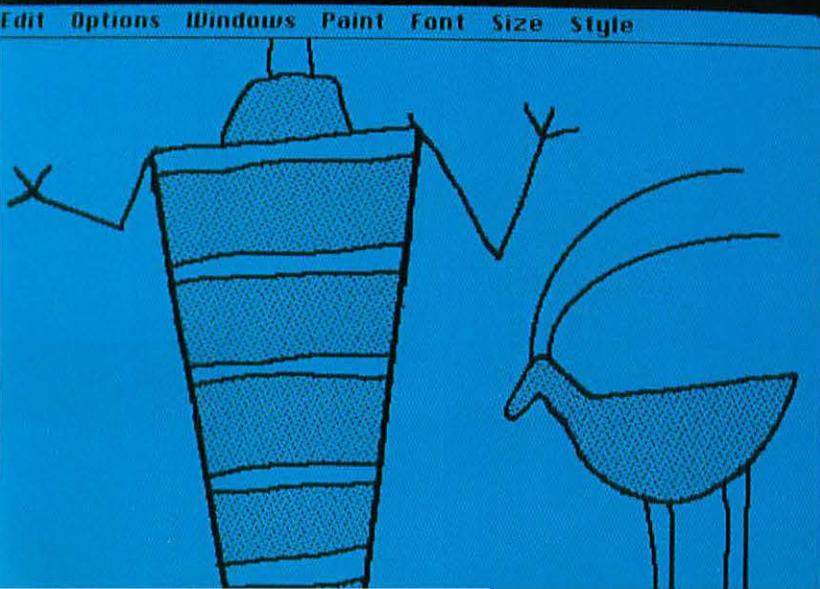
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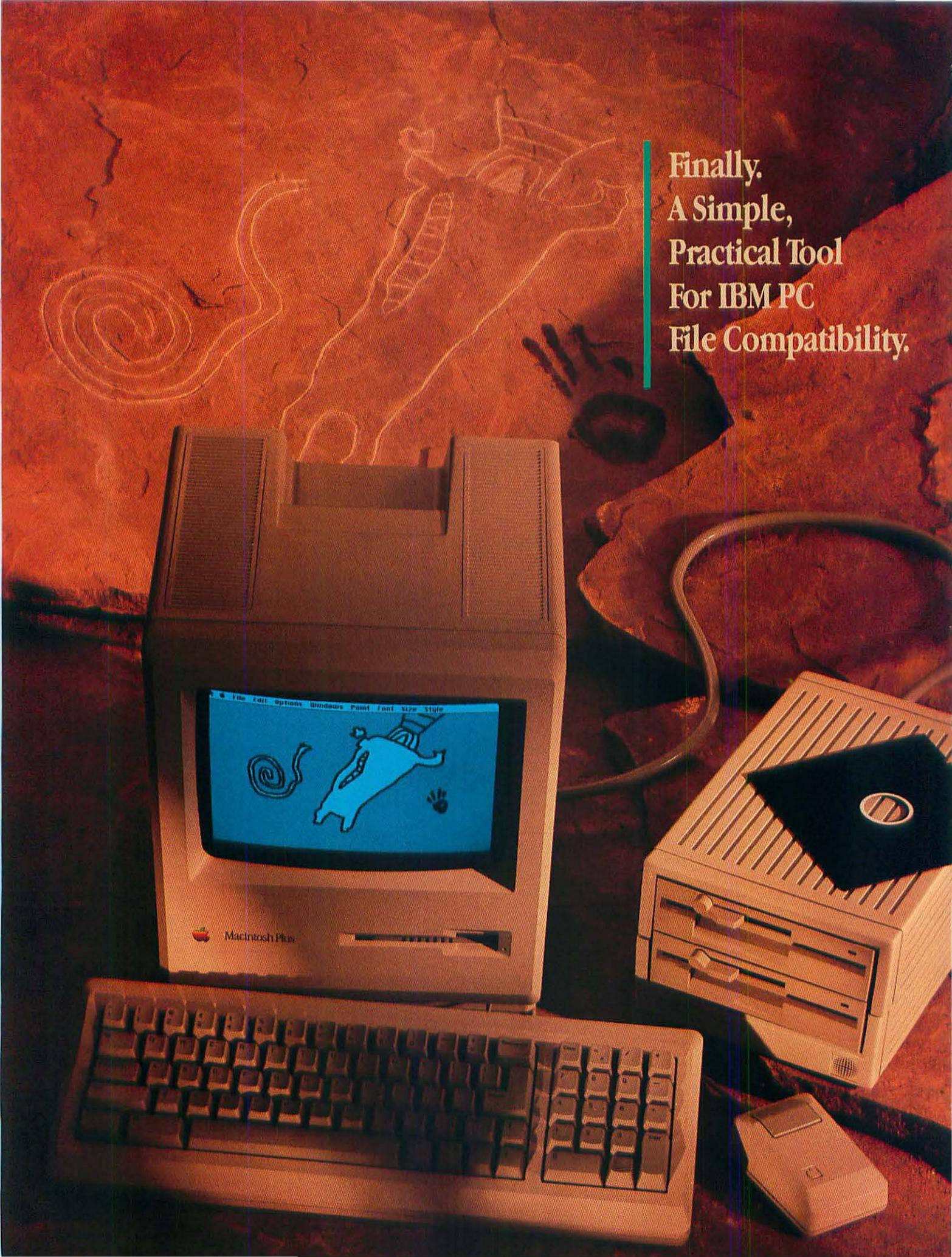
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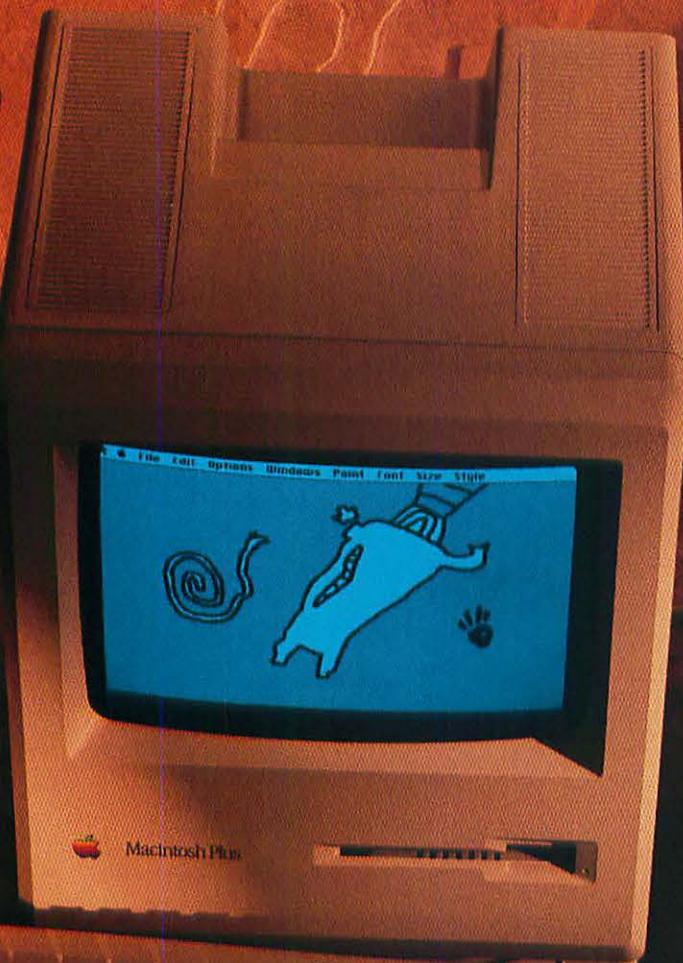
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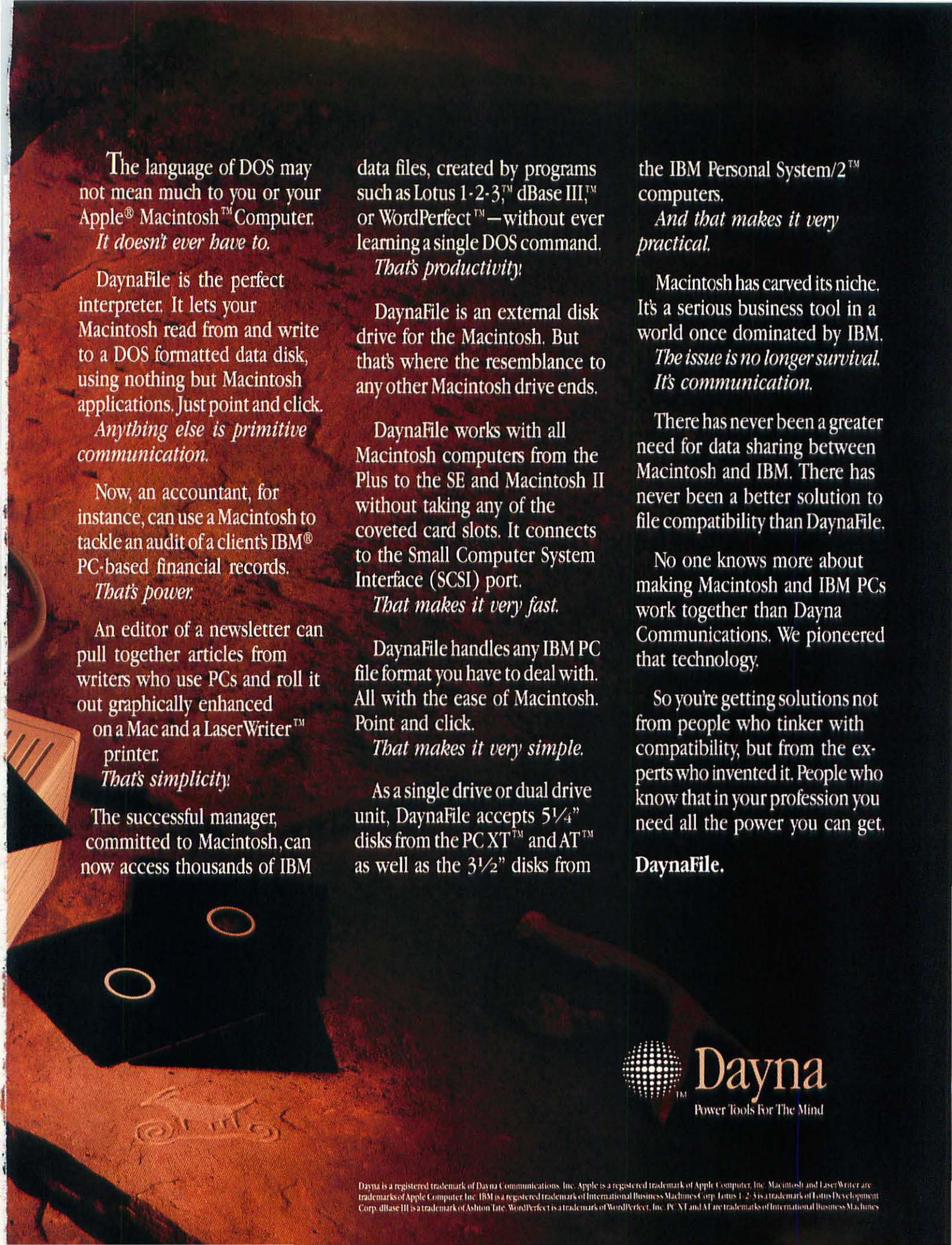


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That makes it very simple.

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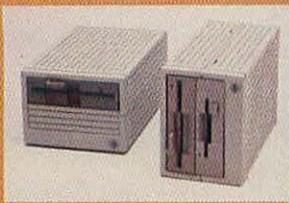
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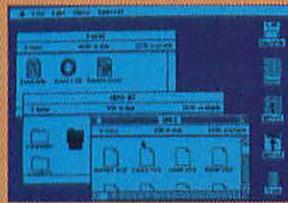
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Supports PC AT™ drives	yes	no
Supports 3½" IBM PS/2 drives	yes	no
SCSI port connection	yes	no

*As of July, 1987.



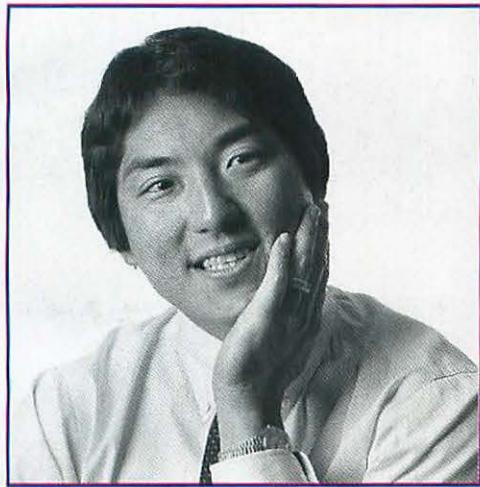
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Verbatim

*An interview with Guy Kawasaki,
president of Acius*



Until his resignation in April, Guy Kawasaki was one of Apple's best-known representatives. Like a politician on the stump, he attended some 30 user group meetings in the last year alone. In his talks he made points—and friends—by poking fun at Apple's foibles.

An ex-jeweler, Kawasaki joined the Mac team while the computer was under development. He went on to head up software development for all of Apple, developing Apple's own software and watching over the team of Apple evangelists who recruit the third-party software publishers that create the vast array of Mac applications. Kawasaki has left Apple on the crest of the wave of the more than 2000 Mac applications he fostered. His next assignment: start up the American branch of the French software company that produced the database manager everyone's been talking about (see "Into the 4th Dimension," July 1987).

In this interview, conducted just at the time of his departure from Apple, Guy Kawasaki reflects on his days at Apple and, with his characteristic humor, puts forward his philosophy of software development.

What did you do at Apple?

I had responsibility for two areas: the product development of Apple-labeled software and the overall relationship between Apple and third-party developers.

What is the role of Apple as a software publisher?

Apple's role is threefold. First, to develop software that shows off Apple hardware. *MacPaint* is an example of that. Second, to set the standard for applications—*MacWrite*, for example, set the standard for Macintosh word processors. Third, to fill gaps in the marketplace when developers do not. *AppleWorks* filled the gap for Apple II integrated software at a time when developers were not creating Apple II productivity programs.

There has been quite a debate about what the continuing role should be.

It's a very difficult problem. While there are good reasons for Apple to publish software, should it compete with the third-party developers who are making Apple's hardware worth buying?

What about the software spin-off?

I think it's a smart move for Apple. It can accomplish all of the above and reduce the conflict with developers. I'd rather compete against Apple-labeled software that doesn't have the word Apple on the label.

Apple isn't half pregnant anymore. It has given birth. But with birth comes considerable responsibility—like revisions, end-user support, and training.

In your comments about Apple software versus third-party developers, you have singled out Microsoft. Why?

Microsoft is an awesome company because it has both great engineering and great marketing. Bill Gates is an absolute genius and a great businessman. But Microsoft's goal is to do what's right for Microsoft.

Sometimes that's in conflict with Mac. A case in point: *Windows* for the IBM PC. I love the Mac, and I get emotional about it. I also oppose domination of the Mac software market by one company.

What's your favorite Microsoft story?

When I asked them about the literature for the *Microsoft Windows* conference that said "Windows—The Future Starts Here," and "Windows—The Foundation of Desktop Publishing." They told me the Operating Systems group is autonomous and that it creates its own promotional materials, and that I shouldn't judge that as being the position of the entire company.

You were just made a director at Apple, so why are you leaving?

Because my job is done, and because the opportunity to create a great Macintosh software-publishing company is too attractive.

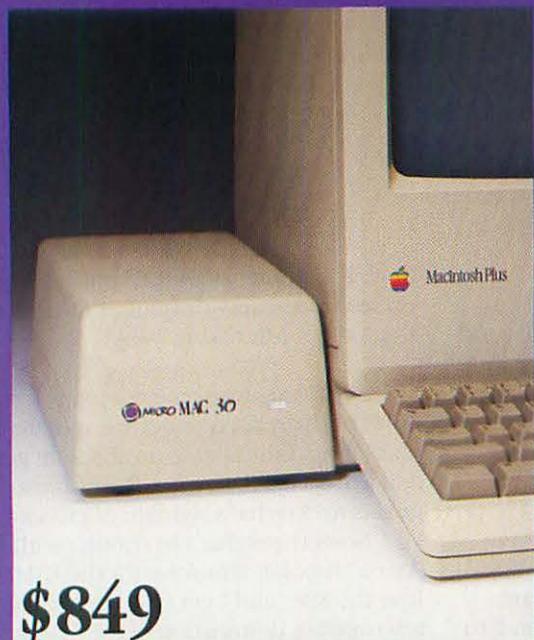
The best thing that I can do for Apple now is to start a Mac software company to show off the Mac and to bring software to market that makes people buy the Mac. Someday maybe I'll return to Apple. "Sugar Ray Kawasaki" has a nice ring to it.

Is anyone at Apple leaving with you?

Yes. Scott Knaster, who was Manager of Developer Technical Support at Apple. Having Scott in the company is like having Doctor

(continues)

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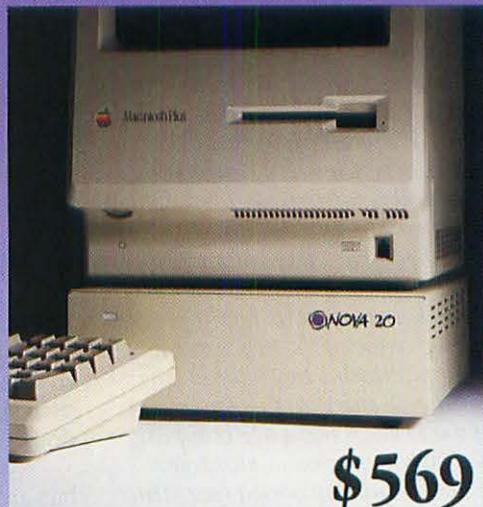
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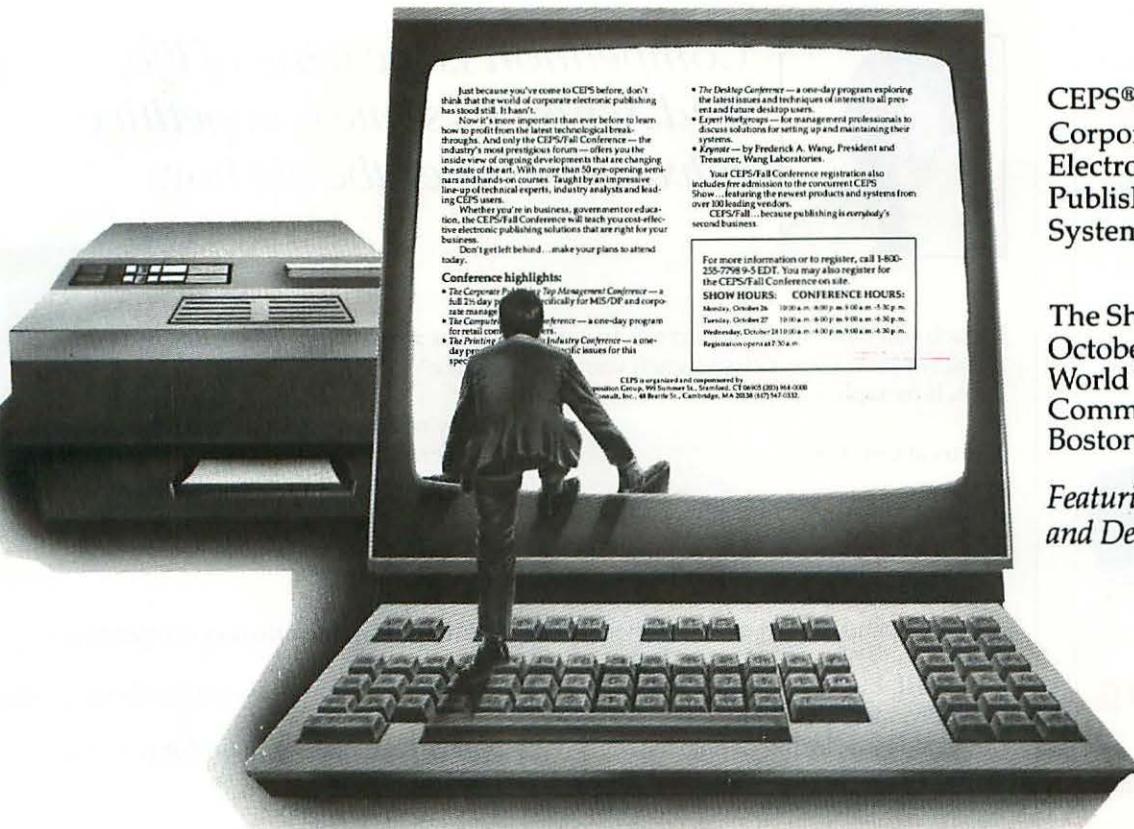


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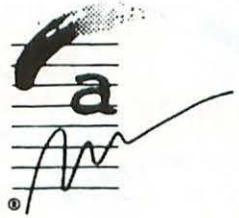
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Tell us about Acius.

It's located in Cupertino, physically and philosophically close to Apple. Acius is a philosophy, not just a company. Our goal is to improve the personal productivity of customers and to turn our customers into fans.

We'll do that four ways: by publishing deep products, providing full service to our customers, hiring people who are product zealots, and developing a long-term relationship with our authors.

What's your first product?

Our first product is a relational database manager called *4th Dimension*. It used to be an Apple product code-named Silver Surfer. It's a relational database with a programming language and *MacDraw*-like graphics, plus multiuser, run-time, and menu-customization capabilities.

Customers should not be saddled with off-the-shelf software. They should be able to tailor products to their needs. *4th Dimension* enables buyers to control the Mac and their information.

But *dBase Mac* will be out any day now.

If I wanted a nice, comfortable existence, I would have stayed at Apple. Competition is the wine of life, and Acius has some competitive advantages over the big boys. The most important advantage is that we love the Macintosh. We don't see it as an alternate income stream to supplement MS-DOS products. When we look at Macintosh, we see our blood and sweat, four years of our lives, and our future.

Because we love the Macintosh, other advantages fall into place. We truly understand the Macintosh way. Technically. Philosophically. And emotionally.

What about Blyth's *Omnis 3* and Odesta's *Helix*?

They're fine products, but we have a very powerful product. The key to *4th Dimension* is evangelism, not sales. We have to make *4th Dimension* the Macintosh database standard, just as we evangelized the Macintosh in 1984.

Will Apple help comarket the product?

I think so. I know a few people there.

Other developers will probably feel uneasy about that.

You mean the MS-DOS companies? I recommend air sickness bags.

Your situation with Acius and Apple sounds a little like the government employees who leave federal employment through the revolving door and use their contact with private industry to personal advantage.

I don't look at it that way at all. We won't be deriving our income from Apple. I think we'll be helping Apple in the best way we can. I will always bleed six colors.

What accomplishments are you most proud of?

My proudest accomplishments are building a great group of people, creating the best developer program in the industry, ensuring that the Mac has the best software of any personal computer, and preserving the Macintosh spirit.

Why did you come to Apple?

The Mac division had hypnotic and charismatic attraction for me. It was managed by

(continues)

**GENERAL
COMPUTER
EXPANDS THE
OUTERMOST
LIMITS OF THE
MACINTOSH.**



When the Macintosh was first introduced, it was heralded as the computer "for the rest of us."

Now it's expanded the definition of "us"—to include corporate users, professionals and others who need a powerful personal computer at work.

If you recognize yourself in that definition, we'd like to introduce you to a family of peripherals from General Computer.

Because each was created not simply to tap the Macintosh's resources as a tool for business, but dramatically enlarge them in the process.

HYPERRIVE LENGTHENS ITS LEAD OVER THE LATECOMERS.

HyperDrive was the first hard disk to be installed inside the Macintosh—and it gave the Mac unprecedented increases in speed and capacity.

Now General Computer extends these increases to the Macintosh SE with a new internal hard disk—HyperDrive FI/40.

Given its heritage, it should come as no surprise that HyperDrive FI/40 is extremely fast. Once installed, an FI/40 will speed power-up time by 57%. Load Microsoft's Excel two times faster. And Aldus' PageMaker three times faster.

These and other reductions in work time are matched by a correspondingly vast increase in the capacity for work. An FI/40 will enable the Macintosh to store the data that would otherwise occupy an astonishing 14,000 pages.

Macintosh Plus
HyperDrive FX/20



Macintosh SE
HyperCharger O20

But all this isn't to say that HyperDrive's elevated performance is denied those who prefer an external hard disk.

HyperDrive FX/20 and FX/40 provide the same speed and capacity to any Macintosh with an SCSI port. And like all internal HyperDrives—which is to say unlike any other hard disk—the FX drives come with a complete array of software.

Including a back-up program that makes quick copies of your data onto diskettes. LaserWriter and ImageWriter print spoolers that queue up documents for your printer, while you go on to other jobs. And a security program that protects your files from unauthorized entry.

NETWORKING SOFTWARE THAT OUTWORKS THE OTHERS.

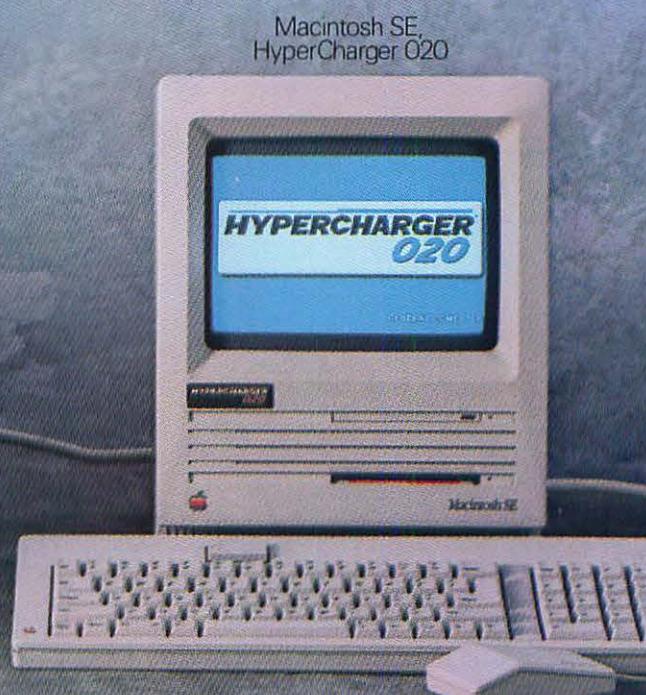
If networks exist to promote the free exchange of information, it follows that the freer the exchange, the better. By that standard, HyperNet 2.0 creates new possibilities for desktop communications.

HyperNet enables up to 32 Macintoshes to read, edit or transfer files from any hard disk in an AppleTalk network. Even if everyone wants to refer to the same information at once.

Unlike other networking software, HyperNet works without need of a dedicated Macintosh to run the network. Or a network administrator to maintain it.

In fact, HyperNet doesn't even require Hyper-

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Drive. It works with any Macintosh and any hard disk made for the Mac. Not to mention all the software compatible with AppleTalk.

Which means you can take full advantage of multi-user programs for electronic mail such as Think Technologies' InBox. Or powerful database managers such as Blyth's Omnis 3.

The resulting network provides a fully compatible complement for people who use AppleShare. And for people who don't, HyperNet provides a fast, easy-to-use network on its own.

INTRODUCING TWO NEW EXPANSIONS OF THE OUTERMOST LIMITS.

If you bought the Macintosh because it delivers "the power to be your best," then more power should make you even better.

That's the mission of the two newest additions to the General Computer family—HyperTape 40 and HyperCharger 020.

HyperTape 40 may not make diskettes obsolete, but it can decrease your dependence on them.

Plugged into any Macintosh with an SCSI port, HyperTape allows you to back up the equivalent of 50 diskettes of data onto one compact 40-megabyte cartridge. HyperTape can be programmed to back up automatically—even when you're away from your Macintosh. And you have the peace of mind that comes with knowing your documents are stored using the most reliable method for

protecting data from accidental loss.

Even greater economies of time and effort are available through HyperCharger 020—a powerful enhancement board which, installed inside the Macintosh SE, delivers the processing prowess of the Macintosh II.

A Macintosh SE thus equipped not only runs most software up to an incredible four times faster. HyperCharger's optional floating point co-processor also allows it to handle financial modeling, statistical analysis, and other tasks which ordinarily would require a much larger, more complex and more expensive computer. And since HyperCharger is internally installed, the SE remains as compact and portable as before.

In sum, no other family of peripherals leaves the Macintosh so thoroughly equipped for superior performance. Or so thoroughly qualified for a career in business.

For a detailed review of those qualifications, stop by an authorized General Computer dealer. And for the name of one near you, call (800) 634-9737. In Illinois, (800) 854-9737.*

GENERAL COMPUTER

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Macintosh Plus,
HyperDrive FX/40



Macintosh SE,
HyperTape 40





The Mac division was an elite part of an elite company in an elite industry.

Steve Jobs, it had the hottest technology, and it was an elite part of an elite company in an elite industry. I had as much chance as a moth.

What was it like, working on the Macintosh, in the Macintosh division?

There was free, fresh-squeezed orange juice, a grand piano, two video games, a great stereo, Jobs's BMW motorcycle, and we could fly first class. We had a pirate flag flying over our building for months. We considered putting a washer and dryer in the building because none of us had time to go to the laundry. We also considered putting a sushi bar in the building so that we wouldn't have to go out to eat.

Have you enjoyed working at Apple?

I've truly loved it. Everybody in their life should work at least once for a company like Apple. The technology is exciting and the freedom is great. Plenty of freedom to soar like an eagle. Where else could an ex-jeweler like me become a software czar?

What is the most enjoyable thing you recall about being at Apple?

Two things. Working with the user groups and seeing the excitement of developers when you show them a new computer.

What's fun about working with the user groups?

Speaking to a user group is equivalent to playing in the Super Bowl. It's a rush to speak to a user-group meeting. It's like going to a spa—when you come out you feel better about yourself.

Take the Pentagon Mac User Group, for example. There are Macs all over the place, and they have screen blankers like the bouncing Trash Can or *Stars*, the one that makes it look like you're flying through the universe. There is *More* output everywhere. It's kind of scary to think that Dave

and Peter Winer run our country's security.

The Air Force asked me about a personal LaserWriter so I asked them about the Stealth. The Army asked me about the Lisa so I countered with the Bradley. The Navy asked me about a laptop Macintosh so I asked them how true *The Hunt for Red October* was. I offered them an Open Mac prototype for a ride in an F-16. They offered me a ride in a Huey so I gave them a 128K Mac instead.

What has been the hardest thing about Apple?

For me it was making the transition from a product division (Macintosh) to a functional organization. As a product division we had responsibility for most aspects of a product: marketing, development, and evangelism all in the Mac division.

A functional organization means that other parts of the company are responsible for the marketing, telling us who to evangelize and how to enhance the product. It was a difficult transition.

Did you make the transition?

Some people think so, some people don't.

Have you ever had any doubts about Apple Computer?

Never.

Who has done the most for Apple computer in terms of an overall contribution?

There is no way to answer that question. Apple computer is like a big pot of stew. What's in the stew is what makes the stew. All the people in engineering, sales, marketing, support, finance, manufacturing, and research make Apple. Maybe bouillabaisse instead of stew.

(continues)

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- HI Honolulu, Software Library, Torod Holst, 808/533-1123
- IL Belleville, Kappel's Computer Store, Mike Kappel, 618/277-2354
Downers Grove, Heath-Zenith/Downers Gve., Steve Hart, 312/852-1304
- IN Evansville, Computerland, Tom Ubelhor, 812/423-6869
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Terre Haute, Hoosier Electronics, Tim Garrett, 812/232-8508
- IA Davenport, Cinarco/Elliott, Trish Mayo, 319/324-0639
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- KY Louisville, Graham Computer Center, Jim Bechtold, 502/423-7120
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Owensboro, Computerland, Tim Hicks, 502/826-6225
- LA Metairie, Computer Shoppe, Frank Boniewski, 504/454-6800
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DON HULL MARKETING NEWS
FOR THE CONSUMER ELECTRONICS MARKET

VOLUME 1
FALL 1986

Top 10 Retail Outlets for Consumer Electronics

OUTLET	SALES (1985)
RADIO SHACK	\$2,200,000
2-K-MART	\$1,800,000
SEARS	\$1,600,000
MILITARY PX'S	\$600,000
MONTGOMERY WARD	\$500,000
SERVICE MERCHANTS	\$500,000
CIRCUIT CITY	\$450,000
GARRET	\$450,000
BEST PRODUCTS	\$450,000
J.C. PENNEY	\$450,000

The latest figures by the Consumer Electronics Industry indicated what analysts believe consumer electronics stores are moving away from. In 1985 to number one spot in Circuit City Stores, a remarkable growth from number 7 in 1984.

Another interesting move is the Military PX's to number one this year. This is expected to be reliable for a long time, as the sales have surpassed 7K electronics stores. One of the "big three" Best Products continues to do well, as does Service Merchandise, J.C. Penney's recent media acquisition. Home electronics has apparently had little effect on their sales. Sales are again in tenth place with the same ranking.

Year sales per store are examined. Creative performance again is the breakdown of their sales (includes TVs, VCRs and video cameras) to be their largest

Shift away from the "Big Three" Electronics Department Stores to the "Big Three" Department Stores. This is due to the movement of stores towards larger discount chains. The largest net gain is of course, the movement of stores to Circuit City Stores, a remarkable growth from number 7 in 1984.

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Year sales per store are examined. Creative performance again is the breakdown of their sales (includes TVs, VCRs and video cameras) to be their largest

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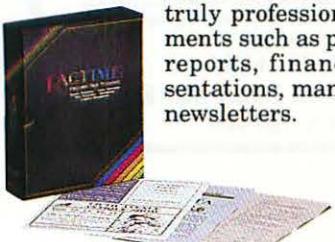
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Military PX Sales Increase 12% in U.S.

For the first time in six years, sales in the Continental United States have shown an increase. This is believed to be the result of the last year's Congressional removal of the cost price limitation on the export products in the same TVs at the end of the ban on remote military bases. This is a further increase in sales.

Continued on page 3

A

ALUMA-FORM, INC. 1900 W. MacArthur Blvd. West Linn, OR 97068 203-782-4577

NEW PRODUCT PROPOSAL - DOOR SHIELD

Background: We must determine whether the manufacturer is within the area of experience and, if so, it is in best opportunity for entering the mobile home after-market.

The Market: currently there exists a method of flashing that is built for each door after installation. This is usually done by the mobile home set-up crew, or by an after-market reseller. This is done at a high cost since it needs to be custom cut and formed for each door. A pre-cut, roll-formed molding would serve the same purpose.

1. Homeowners currently spend an average of \$75 to have custom flashing applied.

2. The product can be manufactured in our Bassett Park plant with existing equipment to sell for \$10 plus installation.

3. Installers, remodelers and homeowners would accept a roll-formed molding.

The Product: A 4-1/4" roll-formed plastic to serve as door flashing. Made of anodized, 0.20 aluminum and .030 baked enamel aluminum in Burnt Oak Brown. Available in 10', 12', standard lengths to fit the standard factory-installed aluminum, Brewsterwood and Silver.

Projected Sales (in units)

Year	Silverwood	Brewsterwood	Silver Oak	AF Sales	TOTAL
1983	1776	789	577	5%	142
1984	1872	1430	742	7%	287
1985	1432	1580	772	7%	372
1986	1725	1699	804	7%	445
1987	2800	1700	800	10%	452
1988	3400	1800	800	25%	1320
1989	3700	2000	900	35%	1800
					2310

The above denotes total number of units shipped and projected to ship. In 1983 to 1986 models would be 40,000 units. For 1987 models would be 40,000 units. For 1988 models would be 40,000 units. For 1989 models would be 40,000 units. For 1990 models would be 40,000 units. For 1991 models would be 40,000 units. For 1992 models would be 40,000 units. For 1993 models would be 40,000 units. For 1994 models would be 40,000 units. For 1995 models would be 40,000 units. For 1996 models would be 40,000 units. For 1997 models would be 40,000 units. For 1998 models would be 40,000 units. For 1999 models would be 40,000 units. For 2000 models would be 40,000 units. For 2001 models would be 40,000 units. For 2002 models would be 40,000 units. For 2003 models would be 40,000 units. For 2004 models would be 40,000 units. For 2005 models would be 40,000 units. For 2006 models would be 40,000 units. For 2007 models would be 40,000 units. For 2008 models would be 40,000 units. 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Apple's biggest challenge now is providing end-user support in an increasingly complex world.

What is the biggest challenge for Apple Computer?

I think it's providing end-user support in an increasingly complex world. The company is selling complex products to demanding consumers. No more one person, one computer.

What has been Apple's best achievement?

Bringing computers to more people and having the chutzpah to take on IBM.

How has it done that?

Guts. Hard work. Luck.

So what do you think of the new IBM PC, rather PS, recently announced?

IBM announced the Mac 128K—about three years too late. It's as if they called up Apple and asked, What should we do to help you for the next three years? There's no system software, existing PC add-on cards aren't compatible with the new PC, IBM didn't bundle in the mouse, and *did* bundle a desktop publishing application program. That will make all the other developers really happy, as the *MacWrite* bundling did.

Who are or were the characters at Apple?

Jobs, Alain Rossmann, Mike Boich, and Mike Murray. Jobs because he is a genius and the most electrifying speaker I've ever

heard. Rossmann because he has the best combination of marketing and technical expertise. Mike Boich because he is the smartest person I know, and Murray because he took a chance on me.

Where did the term *evangelism* come from?

Murray made it up. He decided that we shouldn't just go and meet with developers. We should change their lives, change their blood, even, from blue to Apple's six colors.

What advice would you give to new people at Apple?

Break all the rules. I did. We had rules for selling equipment, providing technical support, distributing documentation. I broke them all. It was a point of pride for me. I think I was maybe second only to Steve Jobs in that. He made the rules, though, so it was all right if he broke them.

(continues)

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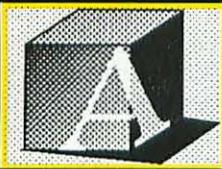
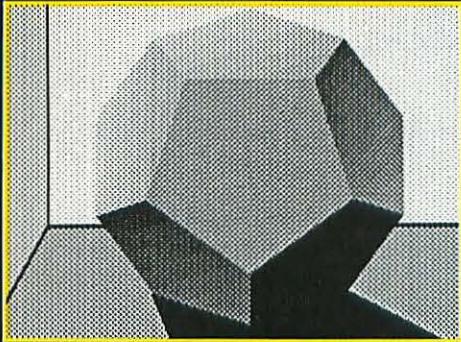
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The pundits always try to make marketing more than what it is. It's mostly empathy for customers.

You're known for your anecdotes. What are some favorite Apple anecdotes?

Once the president of KnowWare came to Apple. He used to be the head of an AT&T division. Steve Jobs came walking down a hall with him and asked me what I thought of his software. Not knowing who this guy was, I said that his software didn't have a place in the Mac market because it was too simplistic. Jobs turned to me and said, "I want to introduce you to the President of KnowWare." He set me up good.

I also remember when we did the rollout of the Mac for dealers in Dallas. There was a speaker, John Rizzo, who had on a wireless microphone. After he finished speaking he walked offstage without taking the mike off. You could hear

every footstep. He went to the bathroom, washed his hands, and everything. The entire audience could hear him.

You are often very cynical about the marketing aspect of personal computers. Why?

Perhaps because I am a marketer stuck in an evangelist's body. I'm cynical because the pundits always try to make marketing more than what it is. For me it's mostly empathy for customers.

You've brought much of yourself to Apple, personalized your role with users and developers. Why?

The key to my position is empathy, and people empathize—not organizations. I

learned that from my old boss in the jewelry business, Marty Gruber. The jewelry business is a very tough, personal business where styles, prices, and terms change but relationships are the key.

Some people might say that you've promoted some developers at the cost of others.

That's part of being a real person. We could have run evangelism like a rationalized bureaucracy. In most cases my best developer friends are the same companies that did the most for Macintosh. Like Living Videotext, Silicon Beach Software, and Challenger. So hang me.

What is the process for software development at Apple?

There are two theories. The comic view goes like this:

- Order T-shirts (for the development team).
- Announce availability.
- Write software.

(continues)



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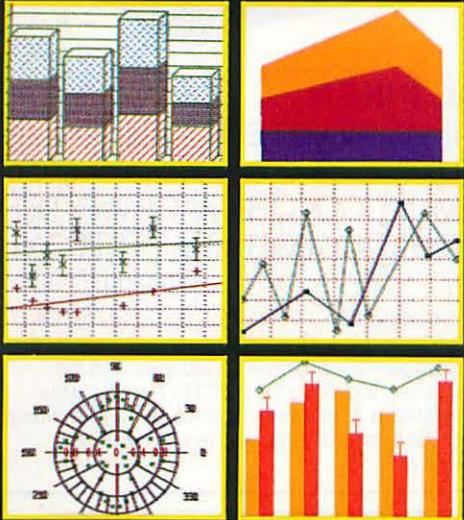
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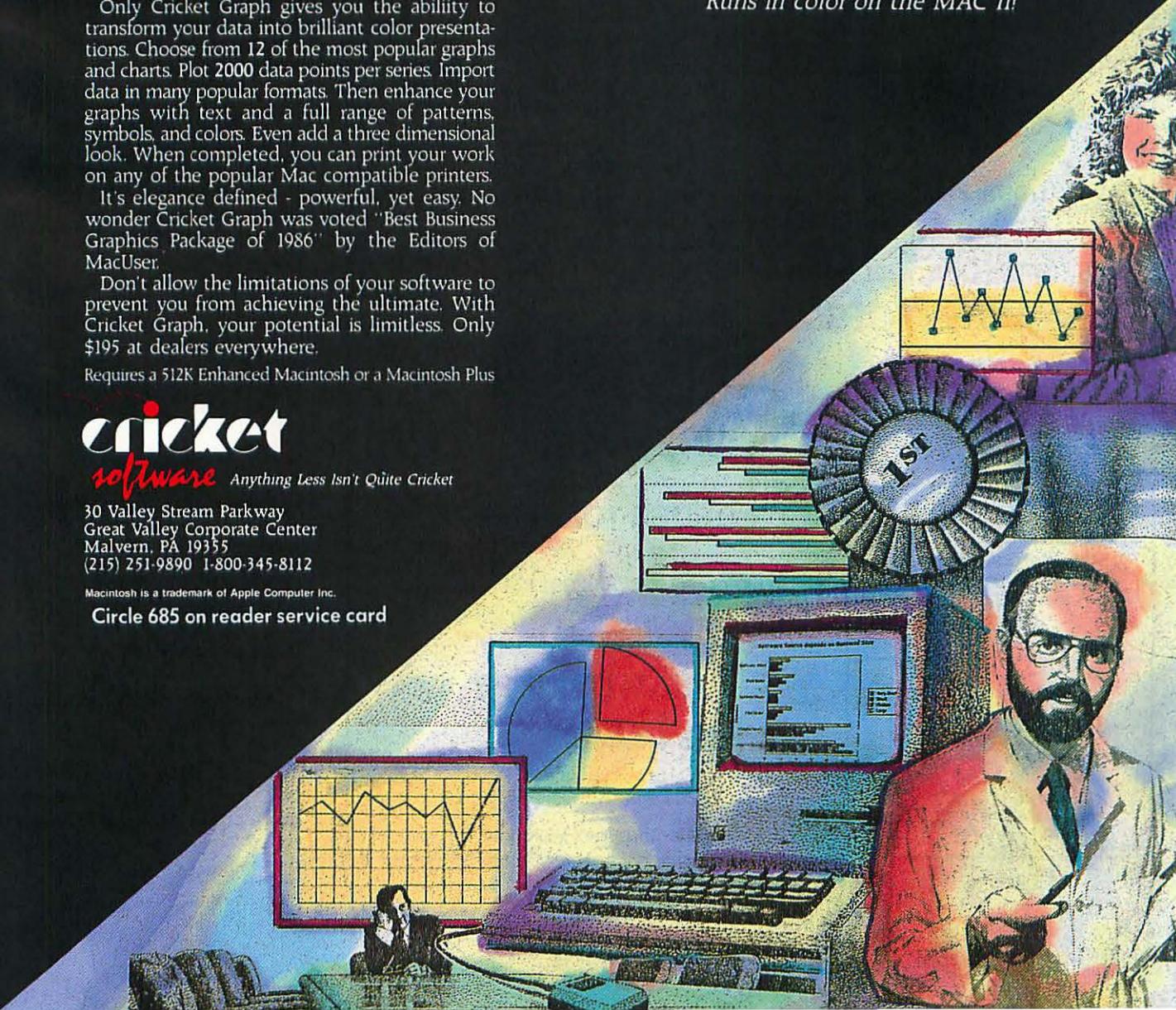
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For the serious side there are two primary paths: history and serendipity. History means that we converted from one CPU to another, like *LisaProject* to *MacProject*, *LisaDraw* to *MacDraw*.

The other way products are developed at Apple is when two people have a great product and are trying to find a publisher. If they can't find someone and it's a strategically strong product, then it's acquired. That's what happened with *4th Dimension*.

Does the Mac cost too much?

No. Does your magazine? *Macworld* probably costs \$1.50 to produce, but on the newsstand it costs more than twice that much. It's Lon Poole, Dan Farber, you, and the other writers and editors that make the magazine. It's the intellectual property that makes your magazine. There is more to a product than RAM, drives, and monitors. I don't complain about the cost of *Macworld*; don't complain about the cost of Macintosh.

What is the best hardware peripheral for the Mac?

LaserWriter, although Alain Rossman and Mike Boich [now at Radius] may have a different opinion.

It was a tough decision for Apple to bring a \$7000 peripheral to the market. Will Apple ever do that again?

I hope so. A lot of people bought Macintosh to run the LaserWriter in 1985 and 1986. It was Steve's vision. I don't know what the next product might be, maybe a color LaserWriter.

What about complaints about all the System and Finder changes?

They are legitimate. I wish it weren't so, but it is. We try to make the system software perfect, but being on the Mac bandwagon

(continues)

Looking for Something New?



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know,

you've heard it all before. Every computer game is "something new." We've been publishing

Macintosh software since the beginning, and believe us, we've

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\$3,895

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1997 • Supports 20 downloadable fonts

\$4,295

Inside

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New
Products

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Stepping Out

From Berkeley System Design

Stepping Out

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Berkeley System Design

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1937 • Works w/512K, 512E, Plus & SE

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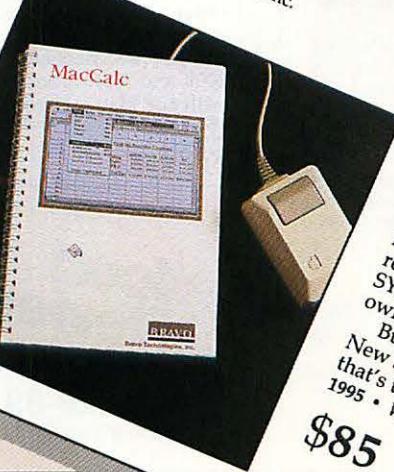
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1888 • Not compatible w/Mac SE & II

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From Bravo Technologies, Inc.



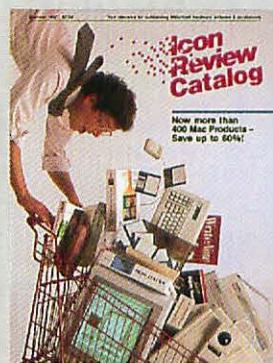
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1900	• IS/One (12x12)	\$ 779
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Verbatim

means new Systems and Finders. Face it, would you rather have MS-DOS or the System and Finder?

What do you think of the computer press that covers Apple?

I have no complaints. I really enjoyed working with the press because it has kept me young and agile. The more cynical, like Stewart Alsop and *Forbes*, the better. If anything, I wish that Mac-specific magazines would lose some of their cheerleader attitude and become more critical.

The best press scene that I remember was David Bunnell asking Mitch Kapur of Lotus where *1-2-3* would be today if he couldn't copy the look and feel of *VisiCalc*. One of the tensest moments in PC history. A great moment.

If you had to set up an office for a small business today, what hardware and software would you choose, excluding Acius products?

The Mac SE, the LaserWriter, and Farallon's PhoneNet. *WriteNow* as a word processor, *More* for outlining, *Excel* as a spreadsheet, *MacDraw* for graphics, *MicroPhone* for communications, *Filemaker Plus* for a database, *PowerPoint* for presentations, and a Radius Full Page Display with an O20 accelerator.

What about for the home office?

Same. There is no separation of home and office for a Macintosh person. My wife will attest to that.

What will happen to evangelism after Guy Kawasaki?

That's a very interesting question. If I did my job well as a manager, my organization will still function well. I just hope I'm not forgotten too fast.

Write your parting scene, where you surf off into the sunset.

I want a conference room named after me so I can take my kids to see it. The usual pattern for ex-employees is that after two weeks people start saying that the person was a bozo. Alain Rossman holds the record for not being bozoed. I want that record too. I hope it comes true. □

Interviewed by Jerry Borrell

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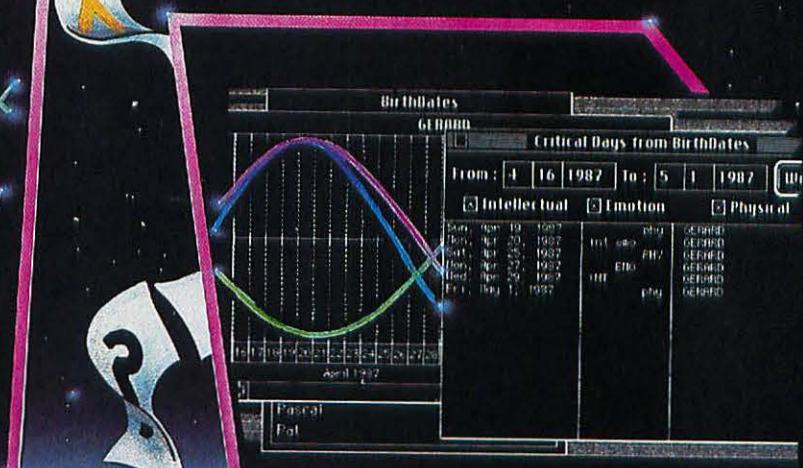
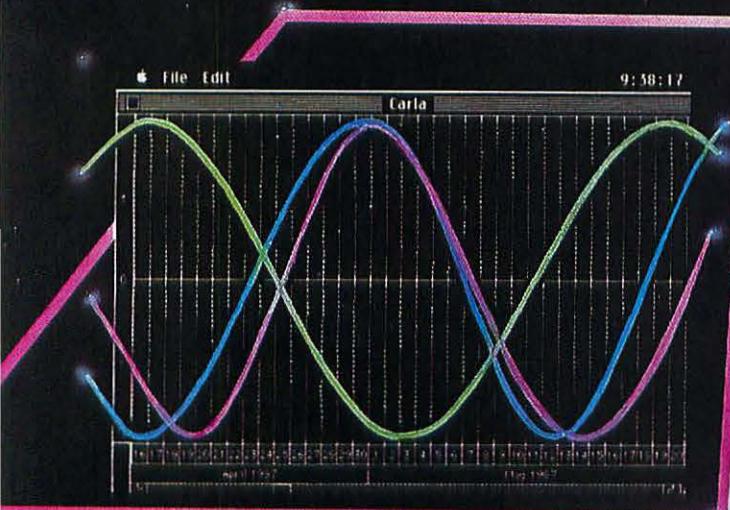
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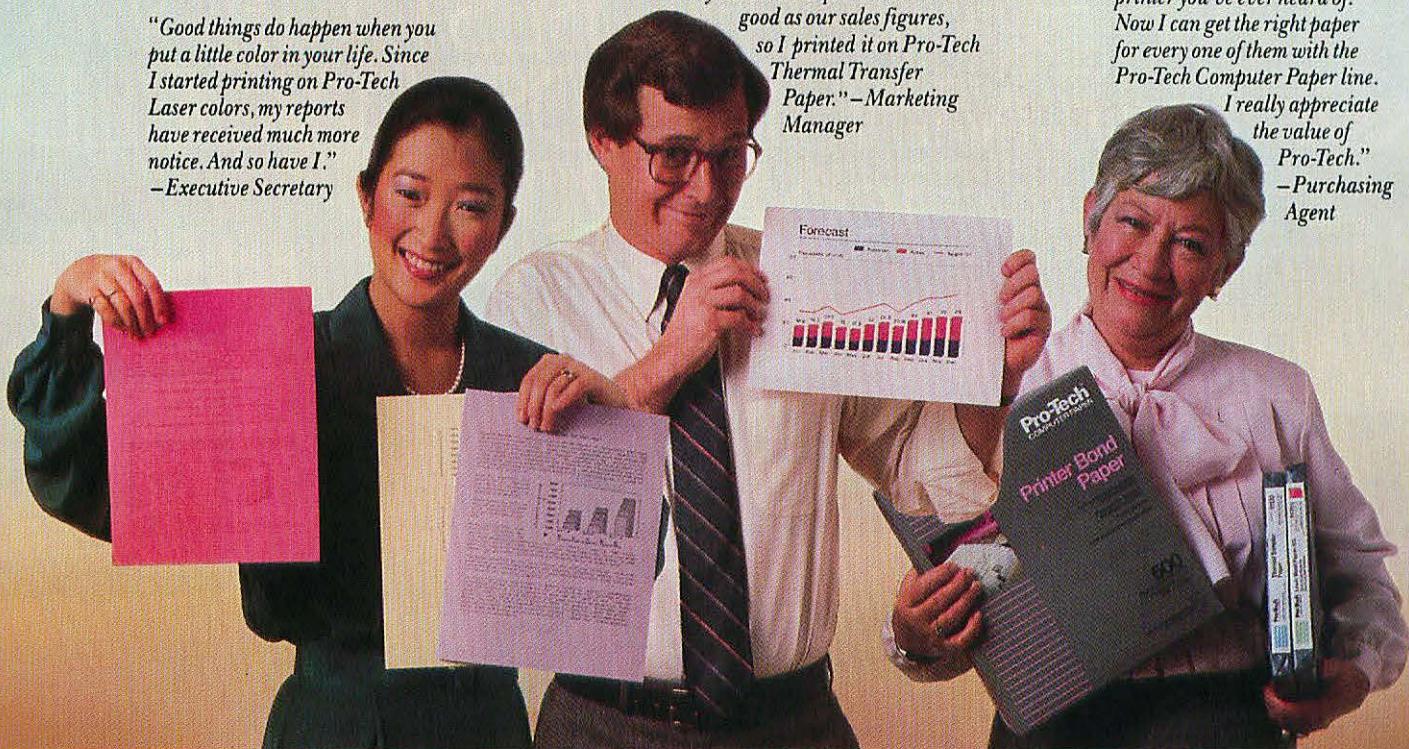
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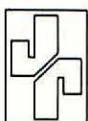
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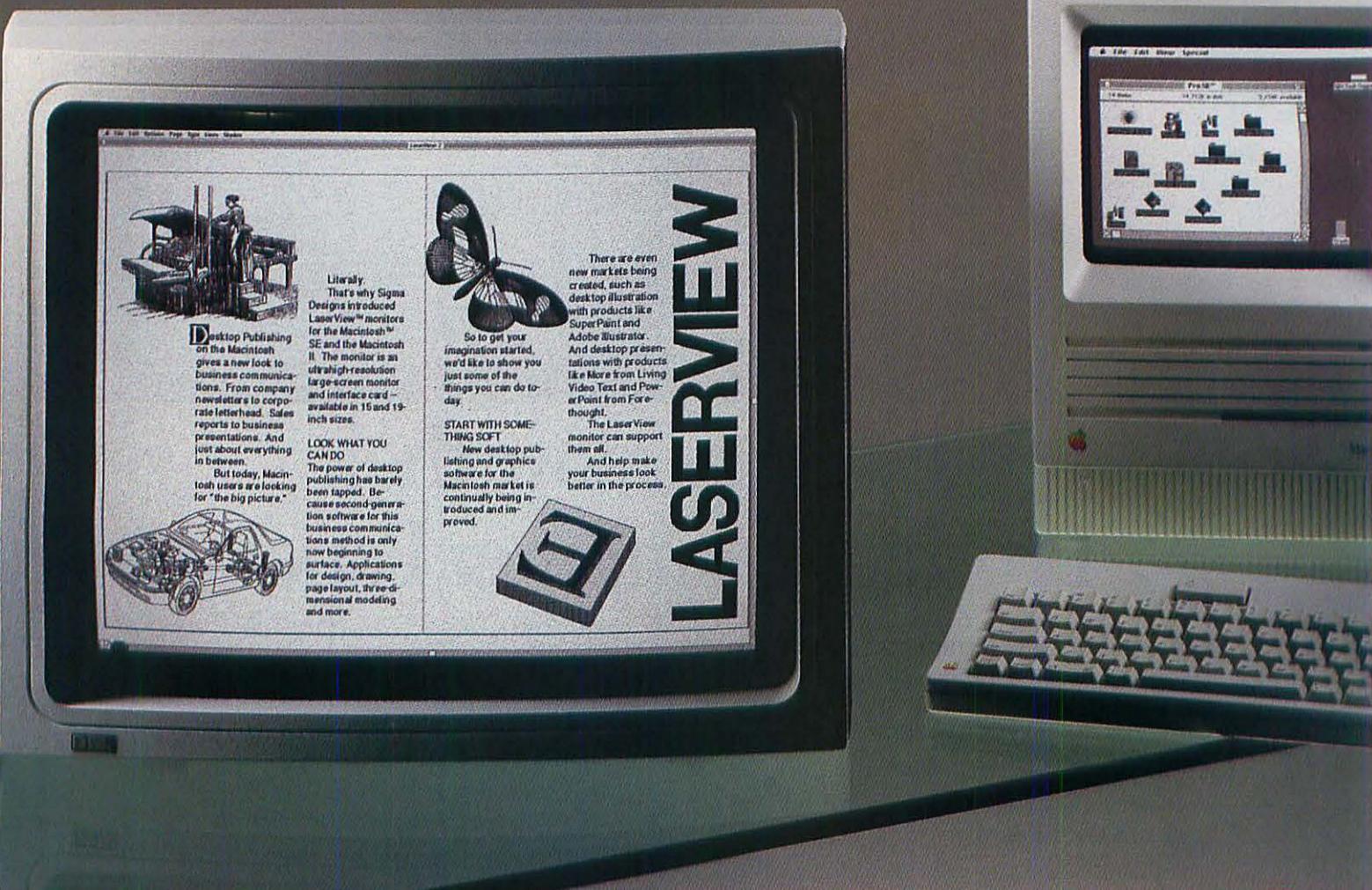
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MWD 8/87

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Macworld News

by Daniel Farber



Writer Douglas Adams's latest book includes a character who programs on the Macintosh.

Anthem

Douglas Adams is the author of *The Hitchhiker's Guide to the Galaxy*, a best-selling book and interactive fiction game for the Macintosh. Since Adams uses the Mac for all his writing projects and for composing music, it seems inevitable that this penchant should spill over to his fiction. One of the two major characters in his latest book, *Dirk Gently's Holistic Detective Agency* (Simon & Schuster, 1987), is a Macintosh programmer writing a program

called *Anthem*—an integrated business program that does spreadsheets, reports, and graphics. He decides to add an extra module as a joke, one that turns data into a company anthem. As it turns out, the musical module makes the software take off in a major way, except in England, because there when a company's data is converted into an anthem, it invariably comes out as a death march.

Adams also got a taste of desktop publishing with his latest book. The British edition was produced on the Linotronic, and the North American version on the LaserWriter.

Adams is still actively producing interactive fiction for the Mac. His latest, *Bureaucracy* (Infocom), is a harrowing journey through the absurdities of red tape. The seemingly simple task of traveling to Paris takes on new meaning as you find yourself dealing with an extremely bureaucratic bank or hanging from a tree deep in the Zalagasan jungle. He believes that the computer fosters an interesting relationship between reader (player) and author. "As an author, you don't know if the reader is concentrating on the book, but as a

game developer, you know that the player must have followed the plot step-by-step to reach each point in the game. As an author, I'm better able to spring surprises and play around with players' expectations."

Ultimately, Adams is waiting for more computing power to realize his ambitions as an interactive fiction author. "Games that involve several people will help restore social intercourse that computer junkies seem to have lost."

Real Estate Software Boom

When the new tax laws were first released, there was a lull in the real estate market. Now that investors, real estate brokers, and financial institutions understand the new laws, we're starting to see an increase in real estate software for the Mac in such areas as property management, mortgage analysis, and real estate office management. According to RealData (203/255-2732), which offers eleven *Excel* and *Microsoft File* templates, the hottest topic right now is real estate investment analysis. The latest version of *MacGuide*, a software listing publication from MENU (800/MAC-MENU), includes more than 30 real estate prod-

(continues)

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ucts for the Mac, up from just 20 less than nine months ago. The latest version of the Heizer Software (415/827-9013) catalog, an *Excel* template publishing service, also includes a variety of low-cost real estate templates.

Another investment analysis product is *ProAnalysis* from Technalysis Services (415/949-4176). Taking full advantage of the Mac interface, *ProAnalysis* produces a nine-page report on each property you want to analyze. These reports determine profitability, cash flow, depreciation, and investment return schedules over a five-year period. *Investor 2000* from Real Estate Microcomputer (206/883-7000) examines various property investment scenarios, taking into consideration multiple economic and financing variables.

Queue (800/232-2224) sells several programs designed primarily for residential and commercial real estate brokers. They include property-listing and client-database management, potential homeowner analysis, real estate office management, and comparative property analysis. Yardi Sys-



tems (805/687-4245) also has a variety of real estate products, including a financial functions tool kit for the real estate industry, investment analysis, and several property management programs.

HMS Computer Company (612/452-5928) offers a mortgage loan calculator that qualifies a potential property buyer by income level or purchase amount. The *HMS Mortgage*

Loan Calculator, designed for financial institutions, home developers, and realty offices, includes provisions for federal and state taxes for all 50 states. Comvest (714/661-1266) sells several real estate programs, including one that simplifies the preparation of the legal documents required for real estate transactions. Finally, MacLord Systems (714/788-4020) offers property management and investment analysis programs.

Even if none of these companies offers the product you want, be assured that more are on the way.—Steve Mann

MathType



Design Science (213/433-0685) has introduced a mathematical typesetting program for the Mac. *MathType*, which works as a desk accessory or a stand-alone application, enables you to create and edit complex mathematical equations. The program automatically sizes, spaces, and positions symbols and takes advantage of the Mac user interface. The \$149 program is also available at education discounts and for site licensing.

Teaching English with the Mac



Computers have long been an integral part of a college education, especially in areas that require serious computational power, like science and engineering. But the humanities are also discovering useful applications for computers. English composition courses are being revamped at places like Cornell,



Dr. Eva Thury is among the educators changing the way students learn English composition skills. Courseware developed for the Mac has proven an effective teaching tool.

Biola, Lewis and Clark, and Cal Poly.

This innovation is a result of the English Consortium, a group of American universities that use the Mac to help students develop English composition skills.

"The computer goes far beyond offering superb editing capabilities; it encourages new kinds of creativity, engenders new attitudes toward writing, and instills new pride in the finished work," says Dr. Joan Mitchell, professor of English at the University of California in Santa Barbara. "When these general attitudes are combined with the special attributes of the Macintosh—extreme ease of use, a simple word processing program, imaginative graphics, and the typography of a printing press—the English instructor can teach writing in new and far more effective ways."

Along with commercial applications such as word processors, outliners, and spelling checkers, courseware has been developed for teaching writing skills. *Tools for Writers*, for example, provides text analysis for reading ease, word frequency, proper use of articles, and subordination, as well as passive-voice and vague-word usage. It also allows instructors to customize diagnostic fea-

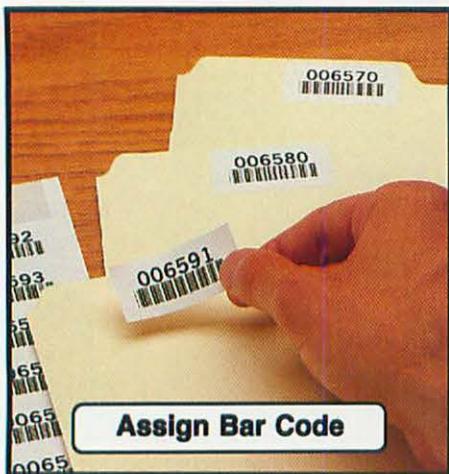
tures for their own special needs. The library of vague words can be expanded by both student and teacher. Additionally, the Spelling Problems Finder accumulates words the student finds troublesome, and can check them against the student's work.

According to Dr. Eva Thury, professor of English at Drexel University in Philadelphia, who is the creator of *Tools for Writers*, "My students like these [programs] because they can actually see what characteristics make up a writer's style. They can see the difference between Swift and J.D. Salinger, who, in *Catcher in the Rye*, used eleven words per sentence and lots of vague words to make his main character sound like a teenager." *Tools for Writers* is not just for students looking at literature. Some professors are using it to teach business students how to write more effective memos and reports. In addition, Automated Language Processing Systems publishes a commercially available text-analysis program—*MacProof*—which is similar to *Tools for Writers*.

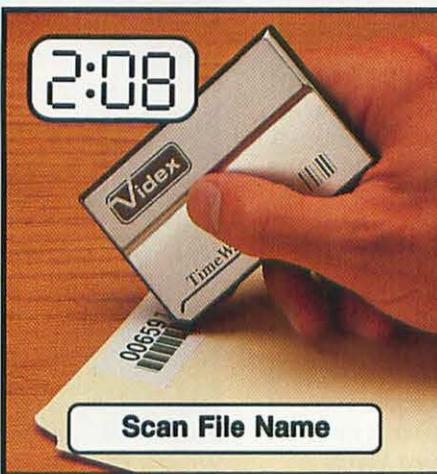
Prose, developed by the Cornell University Writing

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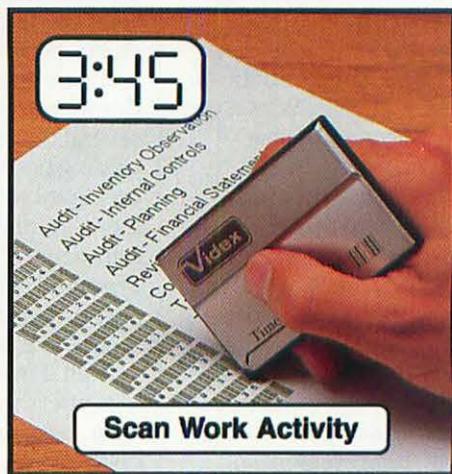
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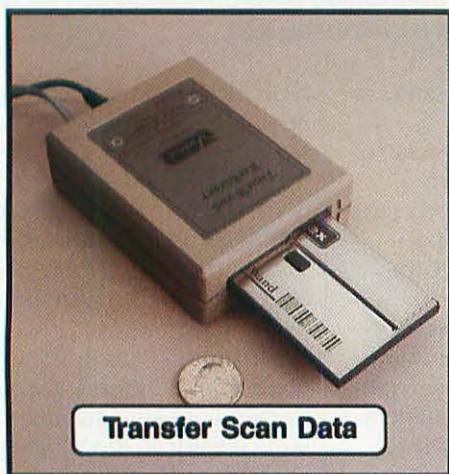
Assign Bar Code



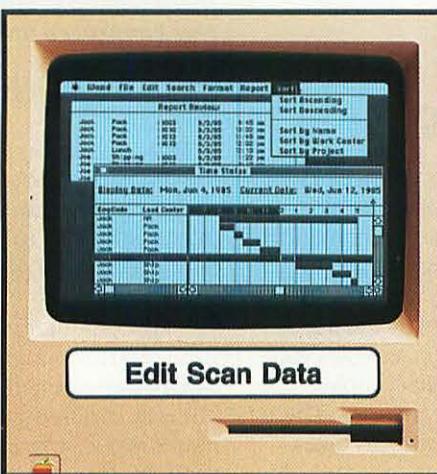
Scan File Name



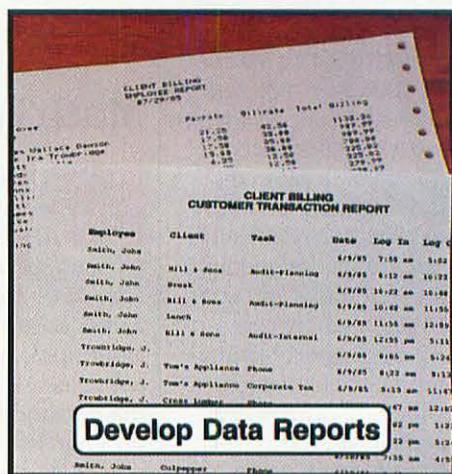
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The TimeWand's recharging/download station uses a standard RS232C serial connector that allows you to communicate with the wand through a variety of host computer systems. Since the communication is keyless, the scan information is sent quickly and error free. Currently, software packages are available for the IBM PC (and compatibles), Apple //, and Apple Macintosh personal computers.

Put the power of TimeWand in your own hands... and let it work for you.

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TimeWand Manager Software (Macintosh) - \$489

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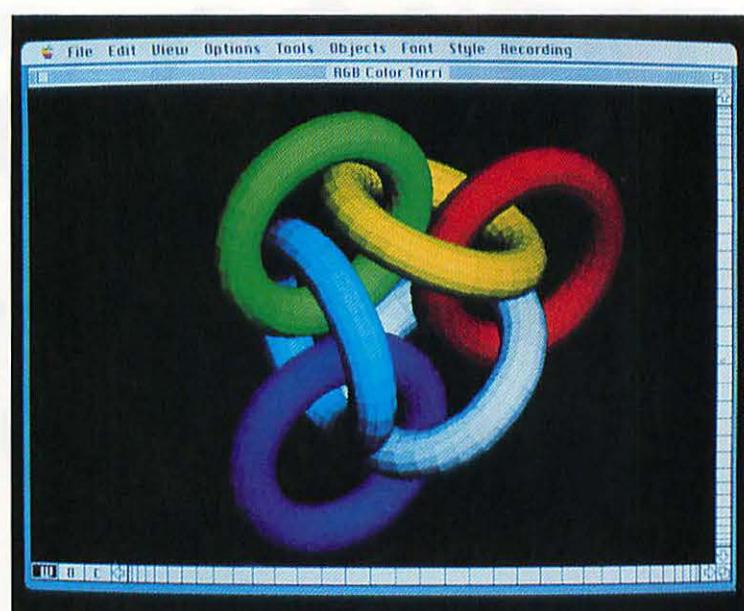
Workshop, helps instructors and students communicate about writing and editing. It provides a forum, on written drafts, for comments and revisions by the instructor. Notations are entered in pop-up windows, and when the windows are closed, small marks appear in the text to alert the student to the notation. The beauty of *Prose* is that it enables the student to see the comments and revisions separately, but when it comes time to revise, the program guides the student through the comments in the order specified by the instructor. Both *Tools for Writers* and *Prose* are available through Kinko's Academic Courseware Exchange (800/235-6919 or 800/292-6640 in California).

Courseware development is only beginning to tap the potential of computers in teaching. More than just a supplement to the curriculum, courseware actually enhances the teaching process. Thury sees the Academic Courseware Exchange program as a new information source that instructors can use to discover new ideas.—Elinor Craig

Mac II and 3-D

 Three-dimensional modeling programs have suffered somewhat on the Macintosh, since the Mac Plus just didn't have enough computing power to render complex drawings in split seconds. With the addition of the 68020 and 68881 processors on the Mac II and various accelerator boards for the Mac Plus and SE, as well as color, things have changed.

Challenger Software's (312/957-3475) *Mac3D* has been modified to take advantage of the Mac II's processors and color capabilities. In addition,



Super 3D from Silicon Beach is typical of the sophisticated CAD applications that will be running on the Mac II.

the company plans to enhance the text capabilities of the program and add more CAD features. Enabling Technologies' (312/427-0408) *Pro3D*, a 3-D solid-modeling program for the Mac II, is slated for release by the end of 1987. The program will have color and an array of new features, including a zoom option and gloss and focus lighting.

The newest 3-D program, seen in a beta version, is Silicon Beach Software's (619/695-6956) *Super 3D*. Like the others, *Super 3D* works in color on the Macintosh II and takes advantage of the 68881 math coprocessor. The program can create and work with both wire-frame and solid objects.

Super 3D offers multiple light sources and cameras, reads text files created by other 3-D graphics applications—including minicomputer, mainframe, and supercomputer 3-D packages—as well as text files created by user-written programs. It can also create objects from user-supplied cross-sections, a function similar to that of *Pro3D*'s Profiler option. *Super 3D* allows you to animate models and store the ani-

mations on disk for playback. The program also has a customizable user interface that adapts to users as their skills grow.

As the Mac II proves itself in the field, expect companies that develop 3-D modeling software for other computers to bring their programs to the Mac.

Robots and Beyond

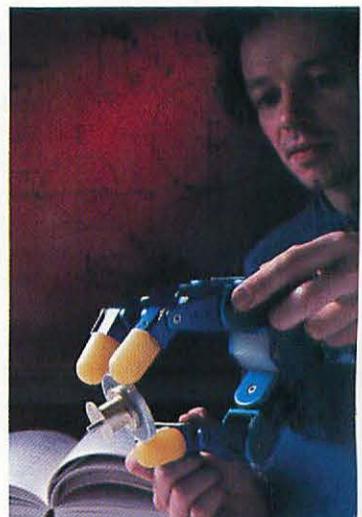
 "Robots and Beyond: The Age of Intelligent Machines" is a four-million-dollar traveling exhibit sponsored by Digital Equipment Corporation in association with the Kurzweil Foundation. Computer novices are likely to find the exhibit as interesting as will computer scientists. Included are state-of-the-art applications of AI and robotics in industry, medicine, tools for the handicapped, speech recognition, robot skin, and artificial vision. MIT Press is preparing a book on the event.

Three areas of the show are devoted to the arts. First, there's a continual projection of famous robot scenes on film—one of the robots from *Short Circuit* is even on display. Next, applications of robotics to painting are demonstrated. Finally, the Macintosh is featured in the AI and music section of the exhibit.

Charles Ames of Buffalo, New York, spent nearly six months designing *Cybernetic Composer*, proprietary software that became the centerpiece of the music portion of the exhibit. Onstage are a Mac Plus, two MegaScreens, and an Apple Hard Disk SC, interfaced to a Kurzweil 250 digital sampling keyboard and sound system. Exhibit-goers use the Mac to choose the style of music they want to hear: rock, standard jazz (à la Art Blakey), or Latin jazz. The Mac then uses the Kurzweil 250 to perform music it has composed in the chosen style.

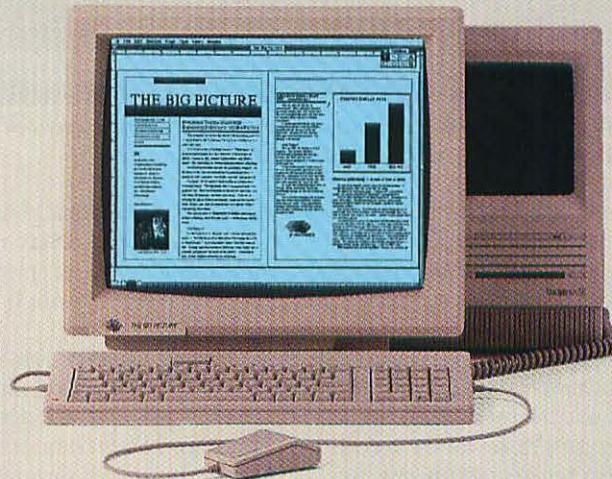
Cybernetic Composer actually composes the music overnight while the museum is closed. The reason? The program takes about as long to compose the piece as it does to perform it. While this is much faster than the rate at which humans compose music, it's still

(continues)



A museum exhibition profiles robotics and AI applications.

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In fact, one of the most tangible statements about E-Machines' commitment to engineering quality can't be seen on the screen at all. You have to look behind *The Big Picture* to see the FCC "B" certification stamped right on the back.

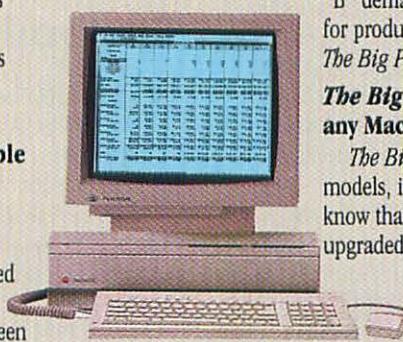
That's the highest rating attainable. Rather than settle for the easier to get Class "A" certification, we pushed ourselves for excellence. Class "B" demands rigorous engineering and is reserved only for products that exceed tough standards. Products like *The Big Picture* and the Macintosh.

The Big Picture is upgradable to work with any Macintosh

The Big Picture is available now for all Macintosh models, including the new -SE and -II. And it's good to know that *The Big Picture* you buy today can be upgraded to work with the Macintosh you may buy tomorrow. Even if you have your sights set on one of Apple's new "Open Macs" or portables from Dynamac™ and Colby™.

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Ask your Apple® dealer for *The Big Picture*. Dealer installation is quick and easy. There's no drilling or soldering which keeps your Macintosh neat, clean and portable as ever. *The Big Picture* and Macintosh. The power to see your best.

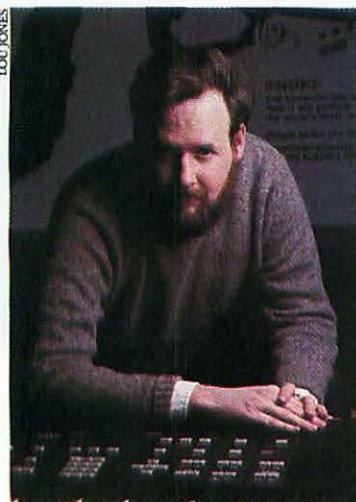


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too lengthy a process for exhibit-goers. Running *Cybernetic Composer*, the Mac is able to compose 40 new works in each style every night and save these onto a hard disk. Each piece is different yet clearly within the defined stylistic categories. Ray Kurzweil has called it "the record that never repeats itself no matter how many times you play it."

Charles Ames stresses, "I'm not trying to put any composers out of business; I'm merely trying to show what is possible with current AI techniques and



Charles Ames teaches the Macintosh to compose music.

how closely this can simulate human processes." The software is continually being upgraded, with new musical styles being added. In fact, by the time you read this, systems programmer Michael Domino will have added a real-time visual score with notes in the shape of Apple logos synchronized to the actual pitches being played. You can watch them while you listen to the music.

When the exhibit opened at Boston's Museum of Science, Ames was asked whether the Macintosh compositions were equivalent to human-generated music, causing listeners to respond in the same way. Ames pointed to a teenager, dancing oblivious in front of the exhibit and said, "She seems to think so." —Christopher Yavelow

Exhibit Schedule:

June 13 to September 1, 1987, Philadelphia's Franklin Institute (Pennsylvania)
 October 3 to January 3, 1988, Science Museum of Charlotte (North Carolina)
 February 1 to April 30, 1988, Fort Worth Museum of Science (Texas)
 June 3 to August 29, 1988, Los Angeles Museum of Science and Industry (California)
 September 30 to January 2, 1989, St. Paul Science Museum (Minnesota)
 February 1 to April 30, 1989, Chicago Museum of Science and Industry (Illinois)
 June 8 to September 5, 1989, Columbus Center of Science and Industry (Ohio)

Inside Macintosh



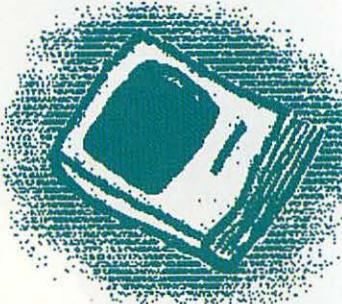
Addison-Wesley is adding the final chapter to the Apple Technical Library *Inside Macintosh* collection with volume 5, scheduled for release this fall. It will cover changes for the Mac SE and the Mac II.

In addition, the *Inside Macintosh Library*, which will focus on specific topics for developers, will be published over the next year. The first offering will be *Technical Introduction to the Macintosh Family*, a language-independent discussion covering basic hardware and programming concepts for first-time Macintosh product developers.

The second *Inside Macintosh Library* title, *Macintosh Family Hardware Reference*, will cover hardware for all the Macs. The third book, tentatively titled *Macintosh II and Macintosh SE Cards and Drivers*, will focus on the NuBus and the SE expansion port. The fourth in the series, *Programmer's Introduction to the*

Macintosh, will be similar to *Technical Introduction to the Macintosh Family* but heavier on programming concepts.

Another set of *Inside Macintosh Library* books is also in the works. These will provide



about 2000 pages of documentation in three volumes: one on the Toolbox; one on System software; and one volume of summaries and indexes. The advantage of this recompilation of *Inside Macintosh* is that it organizes the information better, so readers waste less time thumbing through the volumes for cross-references.

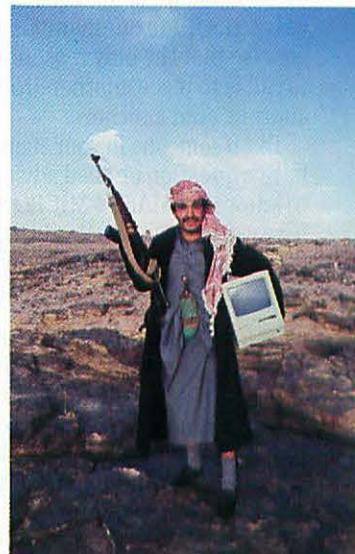
Addison-Wesley will also release Scott Knaster's new book, which picks up where *How to Write Macintosh Software* (Hayden Books, 1986) left off. The new book includes information on new machines and should be out in the fall.

key element in the competitive bidding. Oregon State gambled that the user-friendly features of the Mac, along with some sophisticated software packages, would help cut the costs of assigning Americans with technical expertise to the Middle East.

However, problems surfaced almost immediately. Electricity in Yemen is nominally 220-volt/50-Hz and unstable in the extreme. The only Mac the project could buy required an even 110 volts. Government regulations, shipping delays, and red tape involving national security clearance for the university computer expert resulted in the Mac arriving before the computer expert. Left to untrained users unaware of its voltage capacity, the Mac functioned three days and then burned up.

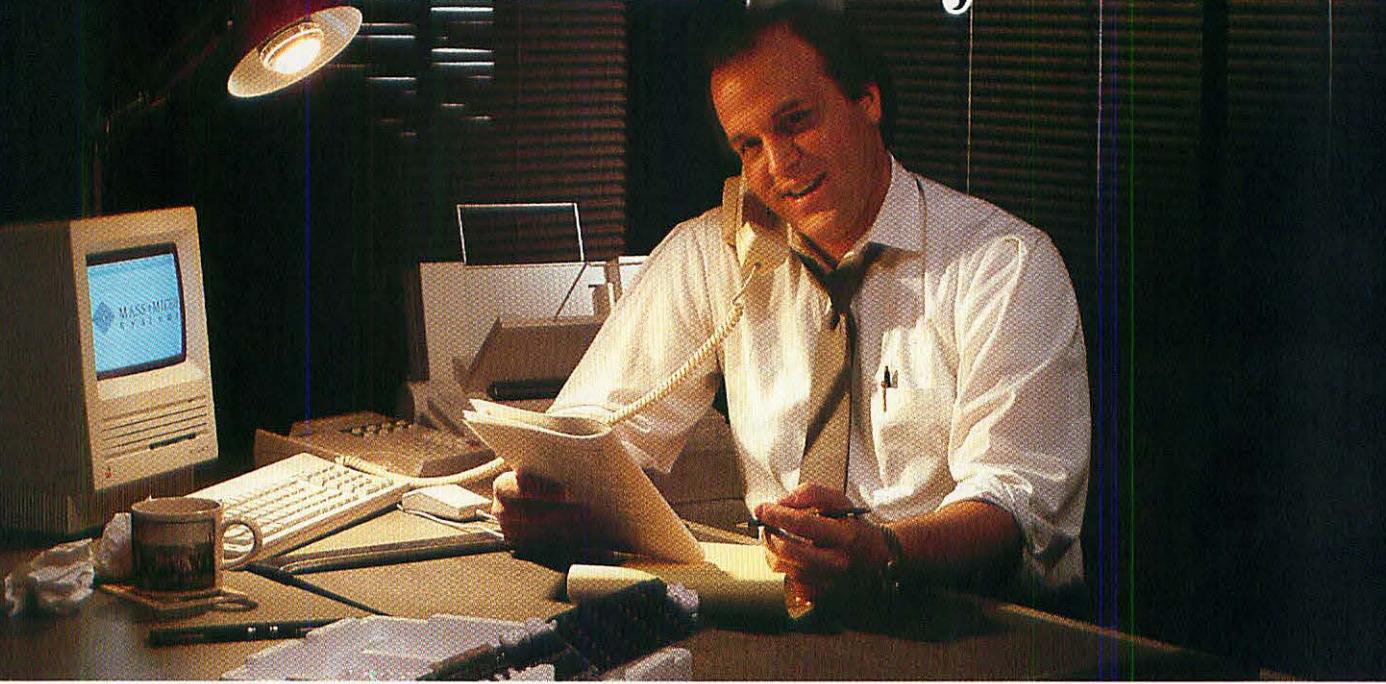
Unfortunately, the problems did not stop there. The fried Mac could not be repaired. Small wonder—the ROM had been stolen. But a second Mac was dispatched, and the staff met the challenge by attempting office automation and more.

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The revolutionary and the revolutionary computer meet in High Yemen.

It's 2 am. We're still with you.



It's never past our bedtime Long after the other companies have gone home to watch their TV's we're still here watching our phones. We do it 24 hours a day, seven days a week.

It's not that we really expect any calls. In fact, we've gone to great lengths to avoid them. We've made our products so easy to use, and our manuals so clear and concise that the only reason you'll want to call is to place another order. And another. And another.

But if someone in your company should have a question or need advice it's nice to know that MASS♦MICRO Systems is here working for you. Ready to give the kind of professional, first-rate service that our competition is home dreaming about.

Now for something really great All of our products carry a full one year warranty, and our memory expansion products carry an unsurpassed lifetime warranty. Your company also receives a 48 hour turnaround on repairs and an incredible 30 day money back guarantee.

We also give you the added option of purchasing any of four different support levels, so you're sure to find one that meets your company's exact needs.

Circle 764 on reader service card



Copyright 1987 MASS♦MICRO Systems Inc. MASS♦PLUS, MASS♦PAK, MASS♦STORAGE are trademarks of MASS♦MICRO Systems Inc. Apple and the Apple logo are registered trademarks of Apple Computer Inc. Macintosh, Macintosh Plus, Macintosh SE and Macintosh II are registered trademarks of Apple Computer Inc.

How do you get this support? Simple. Just purchase any of MASS♦MICRO Systems quality products:

The MASS♦PLUS™ Now you can add our MASS♦PLUS to your Mac Plus and gain a whopping 2Mega bytes of memory, with room to expand your system to its full 4Meg potential. Just plug it into the Apple's memory sockets — no soldering, modifications or headaches here. And like Apple we're using the very latest SIMM technology combined with the new low powered megabit chip. Nothing but Apple standard.

The MASS♦PAK™ If you own a Mac SE or a Mac II, our MASS♦PAK will give you the ability to run huge spreadsheets and more advanced graphics. By using the same SIMM technology and Megabit chips as our MASS♦PLUS you can give your Mac SE the 2Meg advantage. Add another MASS♦PAK and get 4 Megs total. If you have a Mac II you can purchase four Mass Paks and bring your Mac up to a full 8Megs. If you have got a Mac Plus just combine the MASS♦PLUS and a MASS♦PAK for the power you've been dreaming of.

Of course the MASS♦PAK is internal drive and large screen compatible. Neither

we or our friends at Apple would want it any other way.

The MASS♦STORAGE™ family If your company is looking for reliable, quiet and fast hard drives, we have them — from 20 to 160Mega bytes. Three-way surge protection, shock absorbers, and an optional built in modem are just some of the features our drives offer.

At about 2" high, our drives come in either sand or the new platinum color. They fit perfectly under your Mac and look like they belong there. And they do.

So go ahead. Plug one in along with one of our memory expansions to create the perfect couple, MASS and Mac.

More about us At MASS♦MICRO Systems we've been working late to give your company the very best products and support available to Mac owners today.

Keep an eye on us as we continue to work with Apple, to provide quality products at affordable prices for the future of your Mac and its accessories.

So while MASS♦MICRO Systems is becoming a major part of the Macintosh evolution, others are just sleeping through it.

MASS♦MICRO

s y s t e m s

1800 • 253 • 8900 outside California or 408 • 988 • 1200 in California.

3250 Jay Street, Santa Clara, California 95054

A full spectrum of international problems besieged the YALI project. From language differences to complex international communications jamming the modem, the field staff had met their frustration capacity. But finally the Mac came through. In just one week, YALI's bilingual secretary went from no computer skills to unsupervised data input and word processing in both English and Arabic using *MacArabic*.

YALI's pioneering efforts in Yemen have spread confidence in the Macintosh. In other Yemen-American projects, where various regulations require the use of Wangs and Victors for office staff, the heads of the United States Information Service and two multimillion-dollar agriculture projects have chosen the Mac.

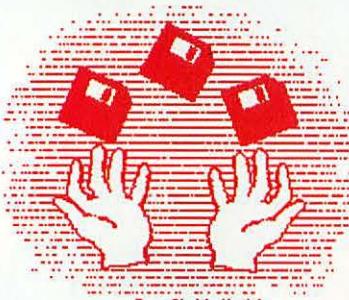
Despite the initial obstacles of setting up the Mac in High Yemen, the remarkable degree of acceptance it has achieved in one short year can be summed up by the comment of the YALI bilingual secretary. Confronted by the Apple II Plus workstation, she dismissed it with total disdain. "It's old-fashioned," she said, turning on her heel and heading back to her Mac.—Deborah Healey

Bargain Desk Accessories

 While the number of commercially produced desk accessories grows at a relatively slow pace, the proliferation of desk accessories available from user groups, bulletin boards, and the like continues unabated. And not only are these free or inexpensive desk accessories increasingly abundant; they are also rich in variety and often imaginatively conceived.

Several desk accessories are handy for those times when

you need to do some file management within an application. *FileStar* 1.0 (Scott Searle, \$15 shareware fee) installs a menu that enables you to rename, delete, move, or copy any file or create a new folder. You can also use it to change a file's Finder attributes and to switch



to a different application without making an intermediate stop at the desktop.

DeskZap 1.2 (Bruce Tomlin, \$15) provides the same file-management functions as *FileStar*, as well as the ability to strip line feeds, strip control characters and high-bit characters (those with ASCII numbers above 127) from text files, add line feeds to a text file, and delete the resource fork of a file. To find a file hidden deep within your hard disk, you can use *HFS Find* from Coyote Systems. This free desk accessory will search your entire disk, or just selected folders, for all files meeting one or more search criteria.

Other desk accessories make convenient reference tools. *Periodic Table* (Jeff Garner, \$5) puts elementary chemistry facts at your fingertips. Jonathan Whitman's *SuperHelp* contains *MacPaint*-style help screens for *SuperPaint*, which lacks on-screen help. Install the two *SuperHelp* desk accessories in *SuperPaint* rather than in your System file; this puts them on the Apple menu only when you need them. Or use *HelpDA* (James McCarthy, \$25), *Extra Help* (John E. Doner and Benjamin F. Shang, free for private use) or *HelpFileMaker*

with a word processor to create your own indexed help files for any other program lacking adequate on-screen assistance.

With *Convert* (Tseung Ngai Cheung, \$15) you can change from one unit of measurement to just about any other at the push of a button. Whether it be a simple conversion (from inches to miles, say) or a complex one (such as cubic yards to milliliters), *Convert* can handle measurements of length, weight, area, volume, temperature, energy, and more. And once you enter the rate, term, and amount of a loan into *Amortization Calculator* (Roger V. Mitchell, free), you can quickly calculate the size of your monthly payment and the remaining balance at any time during the loan's lifetime.

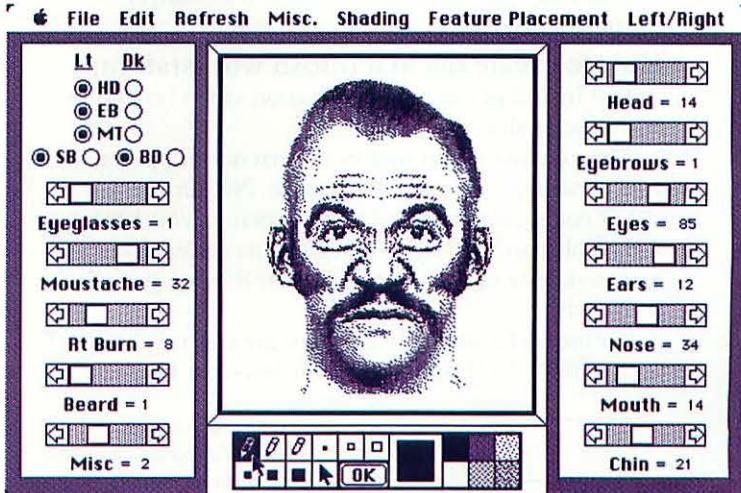
—Robert C. Eckhardt

ment agencies are using the program, including the campus police at Boston University, the sheriff's departments in Milwaukee and Chattanooga, and police departments in Midland, Texas, and East Aurora, New York. The program has over 100 eye combinations and 200 hair parts, and theoretically can produce 10^8 combinations of features.

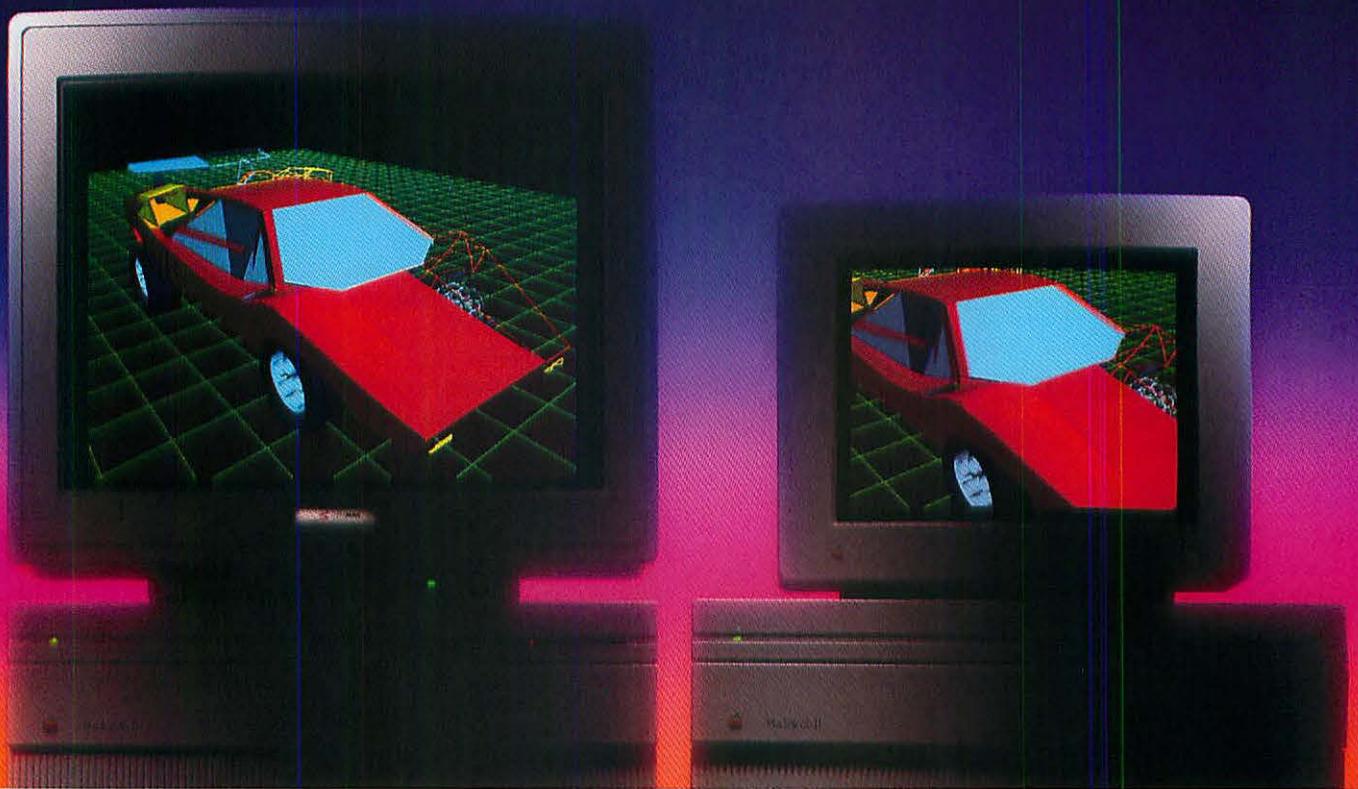
In addition, research psychologists are using the program to conduct experiments in perception and memory. Dr. Leslie McArthur, chair of the psychology department at Brandeis University, uses the program in an experimental psychology course. Students design faces in *Mac-a-Mug* with slight variations in physiognomy. Then the faces are presented to subjects, whose impressions are recorded, based on a series of questions (for example, Does this face look trustworthy?) and a rating scale. A custom program, *MacPsych*, was developed at Brandeis to display the faces and record the data. Students then do statistical analyses of the data and compare the results to their hypotheses. And at the Boston Museum of Science, *Mac-a-Mug* is used as part of a display that encourages visitors to interact with the program.

Mac-a-Mug

Police departments and research psychologists are finding *Mac-a-Mug Pro* from Shaherazam (414/442-7503) a useful alternative to the police artist and photo overlay methods of producing composite pictures of suspects. Several law enforce-



Police departments are turning to *Mac-a-Mug Pro* on the Mac to create composite pictures of suspects.



Quick. Pick the workstation.

It's the Macintosh™ II with the big, high-resolution, high-performance 19" display.

Available only from SuperMac Technology.

Graphics power that turns a great *computer* into a great *workstation*. The result: The ultimate system for running Mac software. Because it is, simply, the ultimate Mac.

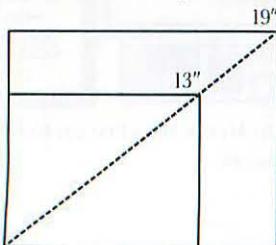
How to create the Macintosh workstation:

Just install one of our workstation video boards in any Mac II slot.

Then connect your monitor. Turn on the power, and you're *running*. No special software. No jumpers.

For color, our *Spectrum™* system brings you 1024 x 768 resolution with up to 256 glorious colors at once, from a palette of over 16 million. Or 8-bit gray scale, if you wish.

For monochrome, you get even greater resolution of up to 1365 x 1024 pixels with our low-cost *Graphix™*



Spectrum offers double the visual area of Apple's color display. So you see much, much more of your work.

system. That means that Macintosh can display a two-page spread with room to spare. *And* you can still read the fine print!

Because SuperMac video boards are programmable, you can even start small and upgrade later. Choose from Apple's 640 x 480 monitor, or choose an 800 x 600 multisync-type monitor for 50% more resolution. Or for the ultimate workstation, choose SuperMac's 1024 x 768 19" workstation monitor.

See SuperMac video before you commit to any video for your Macintosh II.

Only SuperMac video gives you highest resolution.

Only SuperMac video gives you your choice of monitors, up to 19 inches.

Only SuperMac video runs all the standard Macintosh software and A/UX, Apple's implementation of the UNIX operating system.

(And for specialized broadcast applications, we've even included genlockable NTSC output.)

See SuperMac video at your nearest SuperMac video dealer. And see the difference between a great computer and a great *workstation*.


295 N. Bernardo, Mountain View, CA 94043, (415) 964-8884



Monkee Davy Jones got a taste of desktop publishing with his autobiography, *They Made a Monkee Out of Me.*

They Made a Monkee Out of Me

 On September 12, 1966, the first episode of "The Monkees" aired across America. Within a few months Davy Jones, the Brit of the zany, made-for-TV group, and his costars had a hit TV show and a number one song on the pop charts. What happened during the heyday of the Monkees and in the life of Davy Jones is chronicled in a new book, *They Made a Monkee Out of Me*. Rather than go with a major publisher, Jones and his collaborator, Alan Green, published the book themselves with the Mac.

Green had been using a Macintosh to orchestrate a musical he'd written, and he convinced Jones that they could become desktop publishers. Green procured hardware and software—including a ScanCoFurn MacTable, a Micrographic Images MegaScreen, and software such as *ReadySetGo 3.0* and *FullPaint*. Rather optimistically, he projected that the book would be completed in three weeks so that it could be sold at the end of the Monkees' 1986 tour of the States. Three and a half months later, the book—248 pages with more than 400 photo-

tographs—was finally printed.

Green credits the people at MacTypeNet, a service bureau that provided the camera-ready output for the book, with helping solve several problems that came up in the process of preparing the manuscript for printing. You can get *They Made a Monkee Out of Me* from Dome Press, P.O. Box 400, Beaver-town, PA 17813; send \$11.95 plus \$3 postage and handling.

Desktop MTV



If you look inside any professional audio or video box, you'll see a 32-bit bus, an operating system, and a user interface, usually a very expensive custom-built unit. Now that a Macintosh is available with a 32-bit bus, a great standardized user interface, and slots that can take digital audio and video cards, the cost has been drastically reduced. You can create broadcast-quality animation, video, graphics, and sound—like MTV—with an expensive studio.

The real potential is to bring those separate activities together into an integrated multimedia approach. Jim Armstrong, an Apple hardware

evangelist, sees the market evolving over the next few years. Already we are seeing 16-bit audio digitizers, new compression techniques for audio and video (such as RCA's DVI format for laser storage), and companies like MacroMind and Beck-Tech working on video products like frame grabbers and real-time video systems.

According to Mark Canter, president of MacroMind and developer of *VideoWorks* and *MusicWorks*, "You shouldn't underestimate the superiority of the Mac user interface compared to those of existing high-priced custom devices. Before the Mac II you couldn't do real-time composition and editing of music or video. Now you can do 3-D animation and render those images with texture-mapping or ray-tracing algorithms. We are entering a new age of Macintosh TV-MTV."

Steve Beck, president of Beck-Tech, has another name for it—*desktop TV*—which he believes represents the next wave of presentation graphics. Leaving behind the paper output of desktop publishing, television media format, created on a machine like the Mac II, will carry the bulk of information. With 40 million VCRs in the United States today, video is a significant alternative to paper. Beck feels that, with the TV distribution format as one of the

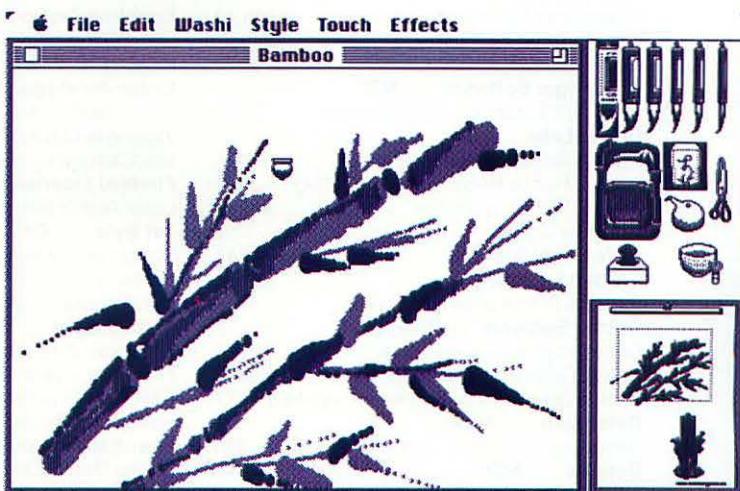
largest local area networks, in just a few years we'll have the potential to beam Mac output from a broadcast facility to millions of viewers.

MacCalligraphy



One of the more unusual graphic applications for the Mac is *MacCalligraphy* from Enzan-Hoshigumi (USA). The program simulates the ink-and-brush-on-paper medium used for calligraphy and oriental painting. Lines are controlled by the speed of the mouse, menu options, and other features, including nine shades of gray, four ink-flow speeds, four tail lengths that finish off a line after the mouse button is released, customizable brush patterns, a seal editor, and a dry brush option that gives a drier appearance to gray lines. The program also comes with several templates for brush patterns, calligraphic fonts, and clip art.

MacCalligraphy comes in a handsome wooden box with sheets of handmade Japanese paper that can be used with the ImageWriter—and a bit of Zen philosophy. For more information contact Enzan-Hoshigumi (USA) at 617/456-8255. □



MacCalligraphy, an oriental version of MacPaint, gives you the feeling of using a calligraphic brush on paper.

Dress your Mac

SOFTWARE

NCP denotes not copy-protected.
CP denotes copy-protected.

Aegis Development ... NCP	
Doug Clapp's Word Tools	\$42.
Affinity Microsystems ... NCP	
Tempo (power user's macro utility)	55.
ALSoft ... NCP	
DiskExpress (maximize disk performance)	27.
Altsys ... NCP	
FONTastic (create your own fonts)	27.
FONTastic Plus (advanced font editor)	49.
Fontographer (Laserwriter font editor)	245.
Ann Arbor ... NCP	
FullPaint (advanced Paint program)	53.
Berkeley System Designs ... NCP	
Stepping Out (requires 512k)	64.
Blyth ... NCP	
Omnis 3 Plus	call
Omnis 3 Plus (multi-user versions)	call
Borland International ... NCP	
Sidekick 2.0	59.
Reflex (information management analysis)	59.
Turbo Pascal (HFS compatible)	59.
BPI Systems ... NCP	
General Accounting (full-featured)	129.
BrainPower ... NCP	
StatView (statistics package)	35.
Graphidex (DA graphics organizer)	69.
Designscope (electronic circuit design)	129.
StatView 512+ (req. external drive, 512k)	179.
Bravo Technologies ... NCP	
MacCalc (easy to use spreadsheet)	85.
Broderbund ... CP	
Print Shop (create cards and memos)	39.
Geometry (over 350 problems!)	64.
CAMDE ... NCP	
Nutricalc (diet & nutrition analysis)	49.
Nutricalc Plus (dietician's delight)	175.
CasadyWare ... NCP	
Fluent Fonts (two-disk set)	29.
Fluent Laser Fonts (Vols. 1-15)	each 48.
Central Point Software ... NCP	
Copy II Mac (includes MacTools)	20.
Challenger Software ... NCP	
Mac3D (3D graphics, CAD features)	119.
Chang Labs ... CP	
Rags to Riches Ledger or Payables	125.
Rags to Riches Receivables (req. 512k)	125.
Rags to Riches Three Pak	299.
Inventory Control	243.
Professional Billing	243.
Cortland ... CP	
TopDesk (7 new desk accessories)	34.
Cricket Software ... NCP	
Statworks (statistical package)	77.
Cricket Graph (multiple windows)	127.
Cricket Draw (advanced draw capabilities)	177.
Data Tailor ... NCP	
Trapeze (spreadsheet, reqs. 512k)	173.
DataViz ... NCP	
MacLink Plus (transfer Mac/IBM data)	159.
Desktop Graphics ... NCP	
DrawArt (MacDraw artwork, req. 512k)	28.
DrawArt Vol. 2 (MacDraw clipart, req. 512k)	42.
DrawForms (requires MacDraw)	30.
Digital, etc. ... NCP	
Turbo Maccountant (GL/APAR/Payroll)	262.

MacConnection Software Special

through August 31, 1987

TRUE BASIC True BASIC

From the people who gave you BASIC to begin with, comes True BASIC. It's the flexible structured programming version of BASIC with a full range of control libraries.

- Features a full editing environment
- ANSI transportable code
- Supports all QuickDraw routines
- Full HFS support

And when you buy True BASIC, we'll sell you either or both of two of the most popular optional libraries, *Calculus* and *3D Graphics* for only \$25. These programs are not copy-protected.

True BASIC \$59.
Calculus (reg. \$35) w/purchase of True BASIC 25.
3D Graphics (reg. \$35) w/purchase of True BASIC 25.

Dove Computer ... NCP

RAMSnap (RAM Disk/Disk Cache) 35.

Dow Jones ... CP

Market Manager PLUS 1.5 159.

Dreams of the Phoenix ... NCP

Day Keeper Calendar 35.

Quick & Dirty Utilities each 35.

Twelve-C Financial Desk Accessory 35.

Dubl-Click Software ... NCP

World-Class Fonts! Vol. One or Vol. Two 28.

World-Class Fonts! (both Volumes) 49.

WetPaint Vol. One or Vol. Two 29.

WetPaint Clip Art (both volumes) 49.

Calculator Construction Set 39.

Electronic Arts ... CP

Deluxe Music Construction Set 2.0 63.

Enabling Technologies ... NCP

Easy3D (create solid 3D objects) 89.

Pro 3D (3D shaded modeling) 199.

Enzan-Hoshigumi USA ... NCP

Japanese Clip Art Scroll 1 "Earth" 65.

Japanese Clip Art Scroll 2 "Heaven" 65.

MacCalligraphy (create unique designs) 119.

Firebird Licensees ... NCP

Laser Author (word processor) 105.

1st Byte ... CP

Speller Bee or First Shapes 27.

KidTalk or MathTalk 27.

Smoothtalker (speech synthesis) 27.

Forethought ... NCP

Factfinder (free-form info organizer) 49.

FileMaker (custom forms & reports) 79.

FileMaker Plus (feature-packed database) 159.

PowerPoint (professional presentations) 269.

Foundation Publishing ... NCP

Comic Strip Factory (create cartoons) 65.

FWB Software ... NCP

Hard Disk Backup (protect hard disk info) 38.

Hard Disk Partition (speeds up hard disk) 38.

Hard Disk Util (program backup) 56.

Great Wave Software ... NCP

Early Music 12.

KidsTime (educational, ages 3-8) 28.

TimeMasters (learn about time, ages 4+) 28.
 ConcertWare+ (music composition) 36.

ConcertWare+ MIDI 75.

Hayden Software ... CP

MusicWorks (songs for your Mac) 29.

VideoWorks (animation) 32.

Home Design (NCP) 49.

Score Improvement for the SAT 59.

Score Improvement: Achievement Test 59.

Ideaform ... NCP

MacLabeler (print disk labels) 29.

DiskQuick (catalog floppies & hard drives) 29.

Imagine ... NCP

Smart Alarms (DA reminder system) 38.

Industrial Computations ... NCP

Powermath (equation solving tool) 59.

Infosphere ... CP

LaserServe (network software) 65.

MacServe (network software) 175.

Innovative Data Design ... NCP

MacDraft (new updated version, 512k) 159.

Kensington ... NCP

Type Fonts for Text (16 new fonts) 29.

Type Fonts for Headlines (req. 512k) 41.

Laserware ... CP

Laserworks (requires 512k, Laserwriter) 229.

Layered ... CP

Notes for..Excel or Microsoft Works each 42.

Legisoft/Nolo Press ... NCP

WillWriter 2.0 (prepare your own will) 31.

Letraset ... NCP

Ready,Set,Go!3 249.

Linguist's Software ... NCP

Tech (1000 different symbols) 59.

FOREIGN LANGUAGE FONTS

SuperFrench/German/Spanish 39.

MacHieroglyphics, MacKana/Basic Kanji,

MacSemitic/Coptic/Devanagari,

MacKorean, MacGreek, MacHebrew

MacCyrillic each 59.

SuperGreek New or Old Testament 79.

MacGreek/Hebrew/Phonetics 89.

LaserGreek or LaserHebrew 79.

LaserFrench/German/Spanish 79.

LaserCyrillic 115.

Living Videotext ... NCP

More (outlines, windows, & tree charts) 158.

Lundein & Associates ... NCP

WorksPlus Spell 39.

Magnum ... NCP

Natural Sound Effects 27.

Natural Sound Cable & Editor Disk 89.

McPic - Volume 1 or Volume 2 29.

The Slide Show Magician 1.3 (CP) 35.

Micro Analyst ... NCP

Mac Zap (recover crashed hard disks) 36.

Microsoft

Flight Simulator (the Mac takes flight, CP) 32.

Basic Interpreter 3.0 (NCP) 64.

Chart 1.02 (42 chart styles, CP) 72.

Multiplan 1.1 (63 col. by 255 rows, CP) 105.

File 1.05 (flexible data manager, NCP) 111.

Basic Compiler 1.0 (NCP) 119.

Fortran 2.2 (compiler, NCP) 169.

Works 1.0 (integrated tool, NCP) 189.

Excel 1.04 (power spreadsheet, NCP) 224.

Word 3.0 (word processor, NCP) 239.

Miles Computing ... NCP

Mac the Ripper (req. Paint program) 27.

Orchestra of Fonts Vol. 4 (30 different fonts) 27.

Soft Wear.

Out on a limb.

We don't want to offend anyone, but people who still use hard copy are seriously out of date. Just take a look at the artistic strokes of genius on our temporarily tattooed friend. Why, for the right price, you could present your next newsletter, spreadsheet, or epic poem in real living color.



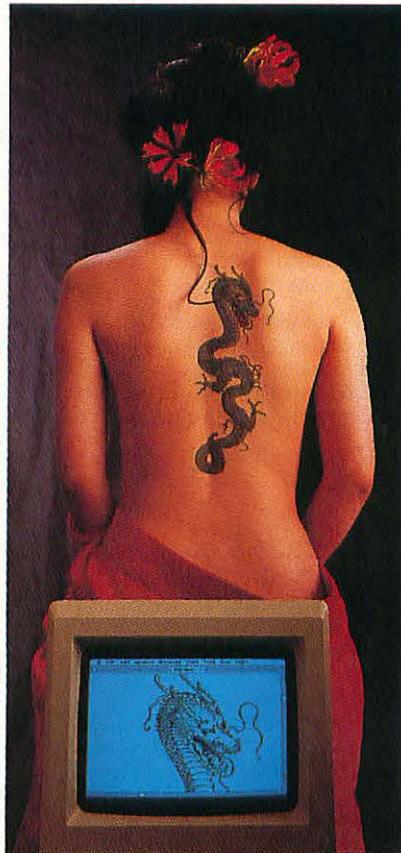
Picture your logo rippling across someone's exotic exterior.

Amaze your boss as the gentle undulations of breath do things to

your five-year plan that you never imagined possible. Why, even editing could be fun again!

Fleshtop publishing.

David Chalk and his partner Roy Zuckerman at Temptu Marketing in New York are designing tattoos on their Mac



which are turning traditional marketing literally inside out.

It all started when Roy saw what his father, one of the world's leading cosmetics chemists, had developed for the movie "Tattoo"—a safer and longer-lasting body paint than anything previously available. He and David were soon selling

the paint in kits along with design transfers which can be applied in seconds with good old rubbing alcohol.

They've done custom work for everyone from Miami Vice to Guinness Stout. And, for quick designs, the Mac is starting to come in handy (and footy, and everywhere in between). Temptu can now digitize very custom images for transfer to very custom parts.

According to our winners, temporary tattooing is "the contact sport of the 80's." So it's only natural that they've chosen the micro of the 80's to help with their design and marketing. Oh, Lydia, could you have had fun with this one. Eh, Groucho?

Contest Winner #9	
Name:	David Chalk, Temptu Marketing
System:	Mac Plus
Applications:	Designs custom temporary tattoos; tracks clients and orders; produces mailing pieces and catalogs.

MacConnection™

14 MILL STREET, MARLOW, NH 03456 1-800/Mac&Lisa or 603/446-7711

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connection.

Deja Vu (<i>murder mystery</i>)	\$30.
PBI Software ... CP	
Strategic Conquest (<i>multi-user</i>)	35.
Primera Software ... CP	
Smash Hit Racquetball (<i>top-rated!</i>)	15.
Psion ... CP	
Psion Chess (<i>3D and multi-lingual</i>)	31.
Rainbird ... CP	
Pawn (<i>fantasy adventure</i>)	27.
Silicon Beach Software	
Airborne! (<i>CP, the classic!</i>)	20.
Enchanted Scepters (<i>CP, over 200 scenes</i>)	21.
Dark Castle (<i>NCP, arcade action</i>)	28.
World Builder (<i>NCP, program creator</i>)	41.
Simon & Schuster ... CP	
Star Trek—The Kobayashi Adventure	24.
Sir-Tech ... CP	
Mac Wizardry (<i>high-rated fantasy</i>)	35.
SPHERE, INC. ... NCP	
GATO (<i>submarine simulation</i>)	26.
Orbiter (<i>space shuttle simulation</i>)	27.
Tellstar II (<i>No. & So. hemispheres, req. 512k</i>)	32.
XOR ... NCP	
NFL Challenge (<i>be the coach!</i>)	79.

HARDWARE

Manufacturer's minimum limited warranty period is listed after each company name. Some products in their line may have longer warranty periods.

NOTE: Some hardware items are available in either platinum or beige color. Please specify.

Apricorn ... 1 year

ApriCord Mac (*for Mac 512k or Mac Plus*) 75.

AST Research ... 2 years

AST TurboScan (*300 dpi scanner*) 1479.

AST 2000 (*20 MB, 20 MB tape*) 1479.

AST 4000 (*74 MB, 60 MB tape*) 3895.

Curtis Manufacturing ... lifetime

Diamond (*6 outlets*) 29.

Emerald (*6 outlets; 6 ft cord*) 36.

Sapphire (*3 outlets; EMI/RFI filtered*) 47.

Ruby (*6 outlets; EMI/RFI filtered; 6 ft cord*) 55.

Dove Computer ... 90 days

Mac Snap 524 (*512k to 1 Meg*) 139.

Mac Snap 524S (*incl. SCSI interface*) 239.

Mac Snap Plus 2 (*Mac Plus to 2 Meg*) 249.

Mac Snap 548 (*512k to 2 Meg*) 369.

Mac Snap 548S (*incl. SCSI interface*) 469.

Ergotron ... 1 year

Mouse Cleaner 360° 15.

MacTilt or MacTilt SE 74.

MacBüffer 512k 329.

MacBuffer 1024k 429.

Hayes ... 2 years

Smartcom II (*communications software*) 88.

Smartmodem 1200 299.

Smartmodem 2400 449.

InterBridge (*connect Appletalk networks*) 599.

IMEGA ... 90 days

Bernoulli Box (*dual 10 MB w/SCSI*) 1579.

Bernoulli Box (*dual 20 MB w/SCSI*) 1879.

Kensington ... 1 year

Appletalk Cable Clips or Connectors each 1.

Mouseway (*mouse tracking pad*) 8.

Mouse Pocket (*for your idle mouse*) 8.

Mac Plus/Mac SE System Saver Cover 9.

MacConnection Hardware Special

through August 31, 1987

20 Megabyte SCSI Hard Drive

This highly-rated 20 megabyte hard drive from a leading manufacturer is one of the most reliable we've tested. Simply connect it to your Mac Plus and gain 20 to 25 floppy disks worth of additional space. Or daisy chain several drives together for even more storage. This beige colored drive fits directly underneath the Macintosh, raising your computer a comfortable 3½ inches.

- Comes with backup software
 - Includes SCSI cable and built-in terminator
 - Convection cooled—no noisy fan
 - Additional SCSI port for daisy chaining
- 20 Megabyte SCSI Hard Drive \$569.

Imagewriter II Dust Cover	9.
Mouse Cleaning Kit w/Mouse Pocket	17.
Disk Case (<i>holds 36 Mac disks</i>)	19.
Disk Drive Cleaning Kit	20.
Tilt/Swivel	22.
Universal Copy Stand	24.
Polarizing Filter (<i>Mac Plus or Mac SE</i>)	34.
Surge Suppressor	34.
Printer Muffler (<i>80 column</i>)	39.
Printer Muffler (<i>132 column</i>)	52.
Control Center	64.
System Saver Mac	64.
A-B Box (<i>for the Mac Plus</i>)	65.
Turbo Mouse	85.
Koala Technologies ... 90 days	
MacVision (<i>digitizer</i>)	175.
Kraft ... 1 year	
3 Button QuickStick	49.
Migent ... 1 year	
Pocket Modem (<i>ext. 300/1200 baud</i>)	169.
Mirror Technologies ... 1 year	
Magnum 800 External Drive	209.
Magnum Tape 20 Backup	899.
Magnum Tape 40 Backup	1199.
MagNet 40/40 (<i>40MB, 40MB tape</i>)	2395.
MagNet 20x (<i>w/cable & backup utilities</i>)	779.
MagNet 30x (<i>w/cable & print spoolers</i>)	949.
MagNet 40x (<i>w/cable & print spoolers</i>)	1299.
MagNet 85x (<i>w/40 MB tape</i>)	3995.
Nuvotech ... 1 year	
EasyNet (<i>AppleTalk network connector</i>)	29.
Personal Computer Peripherals ... 1 year	
MacBottom Hard Drive 21MB (<i>SCSI</i>)	859.
MacBottom Hard Drive 45MB (<i>SCSI</i>)	1285.
SoftStyle ... 90 days	
MacEnhancer (<i>for plotters to printers</i>)	179.
Summagraphics ... 90 days	
MacTablet 12" x 12"	379.
Systems Control ... 2 years	
MacGard (<i>surge protection</i>)	55.
Thunderware ... 90 days	
Thunderscan (<i>high-resolution digitizer</i>)	189.
Powerport	29.
Western Automation ... 1 year	
DASCH RAMdisk 2000k	459.

DISKS

Double-sided Diskettes

Sony 3½" Disks (<i>box of 10</i>)	\$21.
MAXELL 3½" Disks (<i>box of 10</i>)	21.
Fuji 3½" Disks (<i>box of 10</i>)	21.
Verbatim 3½" Disks (<i>box of 10</i>)	23.
3M 3½" Disks (<i>box of 10</i>)	24.

INFORMATION SERVICES

Compuserve

Compuserve Information Service 24.

Dow Jones

Dow Jones News/Retrieval Membership Kit 24.

ACCESSORIES

Computer Coverup

Imagewriter II Cover	8.
Mac Plus & Keyboard (<i>two covers</i>)	10.

I/O Design

Imagewriter II (<i>Imagewriter II carry case</i>)	49.
Macinware Plus (<i>Mac Plus carry case</i>)	69.
Macinware SE (<i>Mac SE carry case</i>)	89.

Innovative Technologies

The Easel (*holds 20 disks*) 13.

Kalmar Designs

Teakwood Roll-top Case (<i>holds 45 disks</i>)	14.
Teakwood Roll-top Case (<i>holds 90 disks</i>)	21.
Teakwood Roll-top Case (<i>holds 135 disks</i>)	29.

Magnum

Mouse Mover (*let your mouse ride!*) 14.

Moustrak

Moustrak Pad (*standard 7" x 9"*) 8.

Moustrak Pad (*large 9" x 11"*) 9.

Sensible Softworks

High Quality "MacAttire" dust covers 7-17.

Smith & Bellows

Mahogany Disk Case (*holds 90 disks*) 28.

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for success. Call your C

Mandscape ... CP	Certificate Maker (CP)	\$35.	GAMES	
The Luscher Profile (<i>personality profile</i>)	24.			
The Perfect Score: SAT	47.			
ComicWorks (<i>create your own comics</i>)	48.			
GraphicWorks 1.1 (<i>newsletters, NCP</i>)	48.			
Monogram ... NCP	SuperSpool	39.	Accolade ... CP	
Dollars & Sense (<i>home, small business</i>)	Diskfit (<i>backup & restore utility</i>)	49.	Hardball (<i>baseball simulation</i>)	\$24.
New Canaan MicroCode ... NCP	SuperLaserSpool	99.	Activision ... CP	
Mac Disk Catalog II (<i>requires 512k</i>)	Multi-User SuperLaserSpool	259.	Tass Times in Tonetown	21.
Odesta ... NCP	Survivor Software ... NCP		Championship Star League Baseball	22.
Double Helix (<i>relational, custom menus</i>)	MacMoney (<i>financial planner</i>)	42.	Shanghai (<i>Mah Jongg strategy</i>)	24.
OWL International ... NCP	Symmetry ... NCP			
Guide (<i>hypertext, free-form info</i>)	Acta 1.2 (<i>outline/writing desk accessory</i>)	38.	Addison-Wesley ... CP	
Palantir ... CP	PictureBase 1.2 (<i>clip art manager, 512k</i>)	44.	Puppy Love (<i>your dog will love it!</i>)	15.
MathFlash, WordPlay or MacType	Target Software ... NCP		Artworx ... CP	
inTalk (<i>communication to emulation, NCP</i>)	Memorandum (<i>electronic post notes</i>)	75.	Bridge 4.0 (<i>sharpen your skills</i>)	20.
PBI Software ... NCP	Telos Software ... NCP		Avalon Hill ... CP	
Icon Switcher (<i>customized icons</i>)	Business Filevision (512k, <i>external drive</i>)	199.	MacPro Football (req. 512k)	30.
HFS Locator (DA organizer for HFS)	Think Educational ... CP		Blue Chip ... CP	
HD Backup (<i>supports MFS, HFS</i>)	MacEdge II or Mind Over Mac	28.	Millionaire, Tycoon, Baron or Squire	35.
Personal Computer Peripherals ... NCP	THINK Technologies ... NCP		Broderbund Software ... CP	
HFS Backup	Laserspeed (Laserwriter utility)	67.	Lode Runner (<i>over 150 levels</i>)	24.
ProVUE Development ... NCP	Lightspeed Pascal (<i>includes debugger</i>)	87.	Ancient Art of War (<i>military strategy</i>)	27.
OverVUE 2.0 (<i>power-packed database</i>)	Lightspeed C (<i>top-rated C Compiler</i>)	127.	Toy Shop (<i>create working models</i>)	39.
Mail Manager Template	InBox Starter Kit (CP)	235.	Bullseye ... CP	
Personal Finance Template	InBox Personal Connection (CP)	85.	Ferrari Grand Prix (<i>Formula One racing</i>)	34.
Rubicon Publishing ... CP	T/Maker ... NCP		Fokker TriPlane Flight Simulator	34.
Dinner At Eight-Silver Palate Bundle	ClickArt Personal Graphics, Effects, Publications, Letters Vol. 1 or 2, Holidays, Business Image each	28.	Electronic Arts ... CP	
Satori ... NCP	Bombay, Plymouth, or Seville Laser font	46.	Archon (<i>arcade strategy, req. 512k</i>)	27.
BulkMailer (<i>mailing lists</i>)	Write Now (<i>word processor</i>)	104.	Skyfox (<i>3D graphics</i>)	27.
BulkMailer Plus (<i>up to 90,000 names</i>)	TML Systems ... NCP		Seven Cities of Gold	27.
Legal Billing (<i>attorneys to accountants</i>)	TML Source Code Library	58.	One on One/Dr J vs Larry Bird (req. 512k)	27.
Legal Billing II (<i>full trust accounting</i>)	TML Database Toolkit	64.	Patton-vs-Rommel (req. 512k)	27.
Project Billing (<i>architects to engineers</i>)	TML Pascal (<i>compiler, req. 512k</i>)	68.	Pinball Construction Set	27.
Silicon Beach Software ... NCP	TrueBasic ... NCP		Chessmaster 2000	30.
Silicon Press (<i>printer utility, 512k</i>)	True BASIC see special		Epyx ... CP	
SuperPaint (<i>advanced graphics program</i>)	Chippendale utilities, Trigonometry, Pre-calculus, Alegbra II, Discrete Math, Probability each	35.	Rogue (<i>strategy dungeon classic!</i>)	15.
Simon & Schuster ... NCP	TrueSTAT (<i>statistics</i>)	58.	Sub Battle Simulator	24.
Mac Art Department (req. Paint program)	Runtime (<i>create stand-alone applications</i>)	59.	Winter Games (<i>Olympic events</i>)	24.
Paper Airplane Construction Kit	Unicorn ... CP		Hayden Software ... CP	
Typing Tutor III (<i>learn to type!</i>)	Animal Kingdom (ages 6-12)	27.	Perplexx (<i>scrabble-type game</i>)	24.
SoftStyle ... NCP	Decimal Dungeon (<i>math, ages 9 and up</i>)	27.	Sargon III (<i>9 levels of chess</i>)	29.
Epsart (<i>Epson printer driver</i>)	Fraction Action (<i>arcade style math game</i>)	27.	Infinity Software ... CP	
Colormate (<i>color printing utility</i>)	Mac Robots (<i>pre-school program</i>)	27.	Grand Slam (<i>tennis, req. 512k</i>)	27.
Printworks (<i>print faster & in color</i>)	Math Wizard (<i>math games, ages 5-10</i>)	27.	Infocom ... CP	
Laserstart (<i>Hewlett-Packard Laserjet</i>)	Read-A-Rama (<i>reading, ages 5-8</i>)	32.	Hitchhiker's Guide to the Galaxy	18.
Softview ... NCP	William & Macias ... NCP		Leather Goddesses, Trinity, Moonmist, Ballyhoo, Bureaucracy (<i>standard</i>) each	24.
Macinuse (<i>time-use manager</i>)	myDiskLabeler (<i>design & print labels</i>)	24.	Zork Trilogy	45.
Software Ventures ... NCP	myDiskLabeler w/Color (req. <i>ImageWriter II</i>)	33.	Invisicles Hint Booklets (<i>please specify</i>)	6.
Microphone 1.1 (<i>includes Glue</i>)	myDiskLabeler w/Laserwriter option	38.	MacroMind ... NCP	
Solutions, Inc. ... NCP	Working Software ... NCP		Maze Wars+ (<i>play via modem or network</i>)	32.
SmartScrap & The Clipper	SpellsWell (<i>spelling checker</i>)	45.	Miles Computing ... CP	
Glue (<i>creates "print to disk" capability</i>)	SpellsWell Medical Dictionary	59.	Harrier Strike Mission (<i>3D flight simulation</i>)	27.
Springboard ... CP			Mandscape ... CP	
Art a la Mac Vol. 1-People & Places (<i>NCP</i>)			Balance of Power (<i>world politics</i>)	30.
Art a la Mac Vol. 2-Variety Pack (<i>NCP</i>)			King of Chicago (req. <i>minimum 512E</i>)	30.

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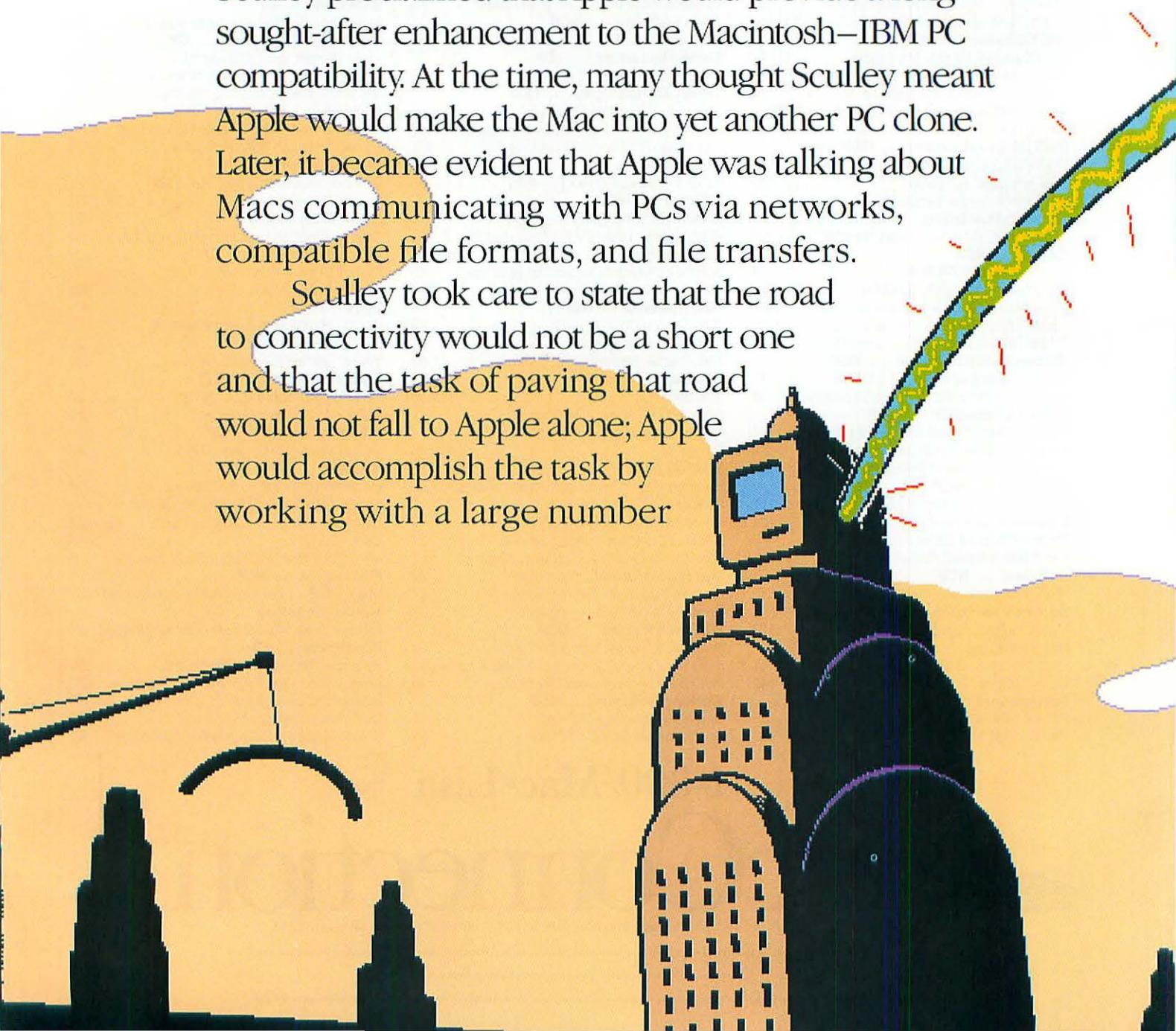
The Road to MS-DOS

Exploring the paths to connectivity

by Rick LePage

Early in 1986, Apple president John Sculley proclaimed that Apple would provide a long-sought-after enhancement to the Macintosh-IBM PC compatibility. At the time, many thought Sculley meant Apple would make the Mac into yet another PC clone. Later, it became evident that Apple was talking about Macs communicating with PCs via networks, compatible file formats, and file transfers.

Sculley took care to state that the road to connectivity would not be a short one and that the task of paving that road would not fall to Apple alone; Apple would accomplish the task by working with a large number





of third-party vendors. In recent months, the announcements of the Mac II, the Mac SE, and related third-party products have helped Apple realize its goal of MS-DOS connectivity. Many of these products break down the formidable barriers of incompatibility that have often separated users into two camps.

Mac users can access information from MS-DOS computers in three primary ways. The most obvious is by placing Macs and PCs on a single network and letting network members share files from a central or a distributed server. The second way is to add a coprocessor board to the Mac—Mac users can then run MS-DOS programs. The third is to connect the Mac to a PC-compatible disk drive that reads from and writes to MS-DOS disks. All three methods can use file-conversion utilities that allow translation of files from one format into another.

Things have progressed from the early days when ASCII text was the common denominator between PC and Mac documents (see "The Macintosh Data Exchange," *Macworld*, December 1986). Now a growing legion of MS-DOS software, in-

cluding page-layout programs like *Page-Maker* 1.1, will at least utilize *MacPaint* and *MacDraw* files. The *Microsoft Windows* operating environment, which will be an option for IBM and Microsoft's new Operating System/2 (OS/2), should offer its own standard graphics file format, but whether that format will be compatible with the Mac's PICT format was undetermined at press time.

Network Paths

Three primary networking schemes are available to microcomputer users—AppleTalk, Token-Ring, and Ethernet. While AppleTalk is the standard in the Mac environment, the PC world is divided. Token-Ring is prominent in many PC environments; however, Ethernet has the largest installed base and is available on a wide range of computers from PCs to VAXes and even on IBM's 9370 minicomputer.

One of the major problems with networking PCs and Macs is that although you can physically link the machines via a network, incompatibilities still exist between operating systems. In addition, while AppleTalk has had a great deal of success

with Mac users, its slow transmission rate (imposed by the standard AppleTalk transmission scheme) is a poor match for DOS-based networking schemes, which offer PC users faster and more comprehensive networking services.

Before the introduction of the Mac SE and the Mac II, the only way a Mac and a PC could talk was through an AppleTalk card placed in the PC. Tangent Technologies was the first company to develop such a product—PC MacBridge—for PC users who needed to access LaserWriters on an AppleTalk network.

The next entrant into the field of Mac-PC networks was Centram Systems West, which offered versions of its *TOPS* networking software for the Mac and the PC. *TOPS*, currently the most prevalent networking solution for integrating Macs and MS-DOS machines, allows PCs and Macs to share files across a network. Participating PCs must have Centram's PC AppleTalk card installed. While PCs are guests on the network, PC and Mac users can share information in a manner consistent with their respective user interfaces. Centram has also released a version of *TOPS* for machines running UNIX BSD4.2 or UNIX System V, allowing PCs and Macs to share files with UNIX hosts. In addition, *TOPSPrint* software lets PC users print to a LaserWriter.

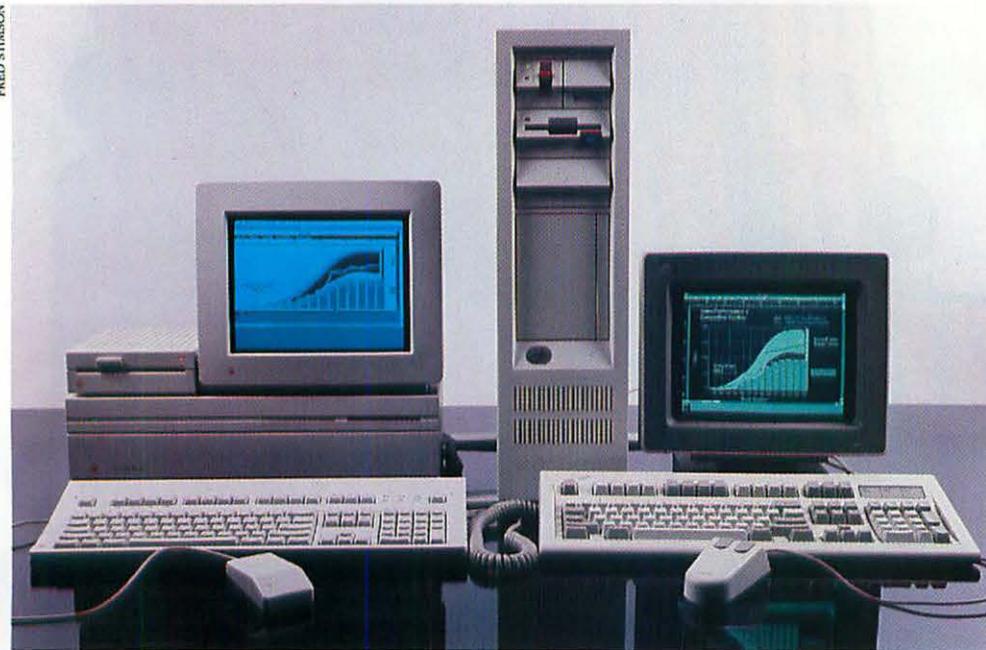
Sharing Apples

In January 1987, Apple introduced the AppleTalk PC card, along with the *AppleShare* file-server software. The card and an accompanying utility let PC users convert MS-DOS files to PostScript in order to print documents on a LaserWriter. Apple intended the AppleTalk PC card to be the hardware link to the MS-DOS world—third-party developers would provide software so that PC users could access AppleTalk resources such as *AppleShare*.

The first vendor to provide this type of software for PCs was Tangent. *TangentShare* allows a PC user to act as a client to an *AppleShare* server: users access files and folders on the server, change protection and access to folders, and copy files to and from the server. In short, with *TangentShare*, a PC user can do anything a Mac user on an *AppleShare* network can do.

TangentShare enables users to easily exchange text files, spreadsheet files, and other format-compatible files between the two operating systems. Users could also

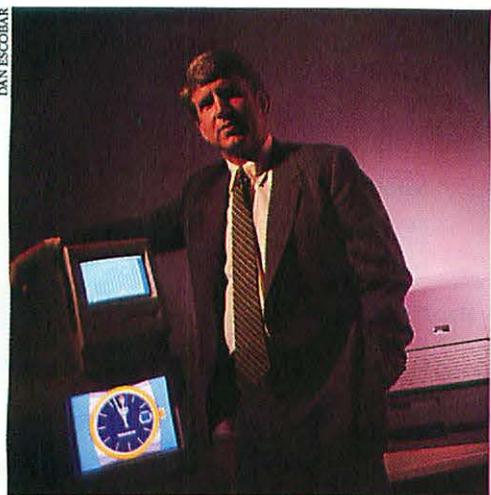
FRED STIMSON



A PC in Disguise

The Mac II, equipped with AST's Mac286 card, displays a graph created with Micrografx's Win-

dows Graph. The same graph on IBM's PS/2 Model 60 is shown on the right.



3Com founder and chairman Bob Metcalf. His company's 3+ network system will unify PC and Mac workgroups located throughout the country.

hook up a PC to both an AppleTalk network and a PC-based network, turning the PC into a gateway between the two networks. Using this setup, one PC user must access Macintosh files from the gateway PC; but after that, the files would be accessible to other users on the PC network.

Tangent also has a number of other utilities that simplify networking with the Mac and the PC. All these utilities work with either Apple's or Tangent's AppleTalk PC Card. For the PC, Tangent offers a version of InfoSphere's *MacServe* client software, which allows PCs to access *MacServe* disk servers on an AppleTalk network. PC *MacServe* users can open and copy files the same way Mac clients do. Tangent also offers *PSPrint* and *WinPrint*, both of which print PostScript and ASCII text files directly on the LaserWriter, emulating the Diablo 630 daisy wheel printer. *PSPrint* works from the MS-DOS environment. *WinPrint* runs with *Microsoft Windows* and allows users to print, for example, files created by Aldus's PC version of *PageMaker*.

PC Post Office

A prime example of Mac and PC users working together is an integrated mail system through which users send and receive mail regardless of the machine they're

using. (After all, the phone company doesn't require that all customers have a particular type of phone.) Think Technologies' *PC InBox*, a PC version of Think's *InBox* electronic mail system for the Macintosh, allows Mac and PC users to share mail and files. *PC InBox* works with PCs that have either Apple's or Tangent's AppleTalk PC Card installed. The limitation of *PC InBox* is that PC users must be on AppleTalk to exchange mail and files. This limitation rules out the possibility of using a PC as a gateway to exchange messages with users on another non-AppleTalk network. However, Think is working on a product that will allow a PC to act as a gateway between AppleTalk and Token-Ring networks.

Internet was also scheduled to release a PC version of *InterMail* (its electronic mail software for the Mac) in May. The *InterMail* PC Message Center, like *PC InBox*, would let PC and Mac users send and receive messages and files. Internet's product will work with Apple's, Centram's, or Tangent's PC AppleTalk card.

The Complete Network

Currently 3Com is the only manufacturer that has announced a complete network architecture for AppleTalk, Ethernet, and Token-Ring. 3Com's 3+ network system allows Macs and PCs to coexist and to use their own network schemes. The product also lets Mac and PC users share files and printers, as well as send and receive electronic mail. Linking an AppleTalk network to the server of a 3+ system that is connected to an Ethernet or Token-Ring network gives the Mac and PC network

users transparent file-exchange and file-sharing facilities.

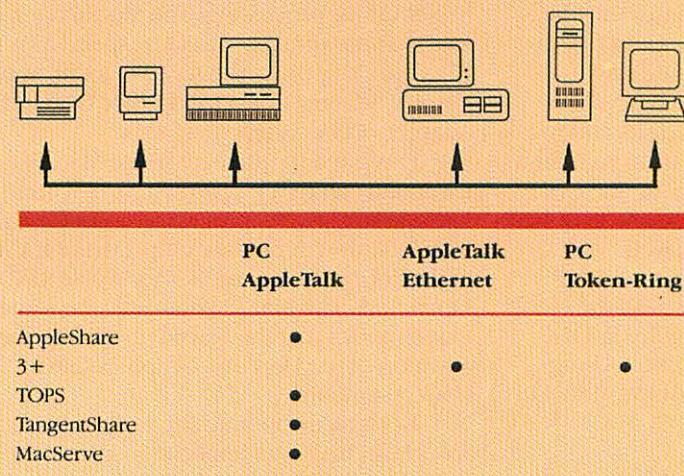
To boost AppleTalk's speed, Apple and 3Com both announced plans to market Ethernet cards for the Mac SE and the Mac II. Apple's version is called the Apple EtherTalk Interface Card. As this article went to press, 3Com had not yet decided on a name for its card. Both Ethernet cards raise the speed limit on AppleTalk networks to a comfortable 10 megabits per second. Currently, 3Com's software is the only application that utilizes the Ethernet cards.

Planting a PC in a Mac

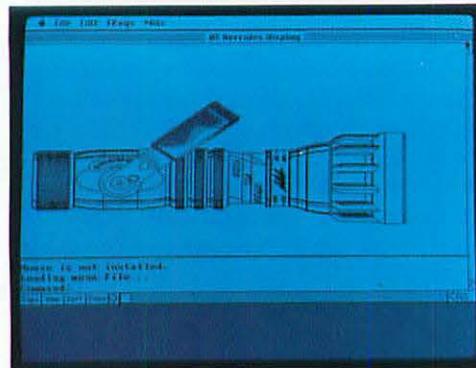
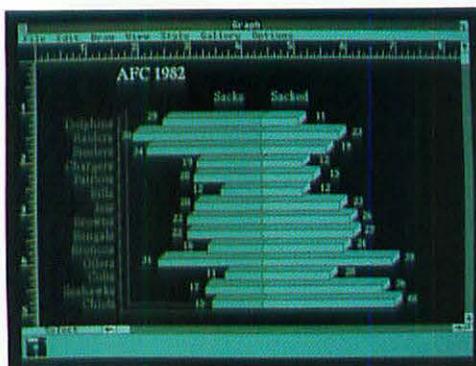
An MS-DOS coprocessor gives a Mac user the best of both worlds without having two machines on the desk. A coprocessor board lets you run PC software by attaching an Intel 8086-family microprocessor to the Mac's central processing unit (CPU). Most MS-DOS coprocessors can use nearly all Mac peripherals—hard drives, modems, and printers. MS-DOS coprocessors take two approaches: the first adds a nearly complete PC motherboard to the Mac; the second adds only the Intel chip and minimal electronics, while relying heavily on the Mac's hardware. At best, coprocessors offer MS-DOS compatibility comparable to what you can find in an under-\$1000 PC clone.

Dayna Communications pioneered the field of MS-DOS coprocessors, announcing its MacCharlie within a year after the Mac's introduction. MacCharlie, an L-shaped unit that wraps around the Mac, is really a PC that utilizes the Mac's screen, user interface, and I/O ports, while relying

Networks



Network Options
Networked PCs can connect to Macs with AppleTalk or by using 3Com's 3+ to connect Macs to Ethernet-connected or Token-Ring-networked PCs.



Tale of Two Screens

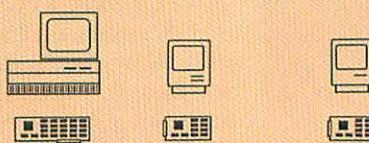
Two documents created on a PC and displayed on an IBM PS/2 (top) and a Mac II with AST's Mac286.

on its own internal hardware (including a 5½-inch disk drive) to run MS-DOS software. One criticism is that MacCharlie is a bulky unit that tends to diminish the Mac's portability.

Since the introduction of MacCharlie, two additional options for MS-DOS co-processing have been introduced. PerfecTek offers MacPlusPC, a clip-on board for the Mac 512KE or the Mac Plus. MacPlusPC is an Intel 8086-based board that clips onto the Mac's 68000 CPU and shares the Mac's memory and peripherals for most operations. Currently, MacPlusPC utilizes Abaton's Drive 5.25, a 5½-inch MS-DOS disk drive, to read MS-DOS disks and programs. However, PerfecTek plans to offer a MacPlusPC version for the new Macs, which will allow the coprocessor to utilize Apple's PC 5½-inch drive as well.

MacPlusPC runs either as a stand-alone application, which uses all the Mac's available RAM (up to the 640K MS-DOS limit), or in a *Switcher* partition. Using MacPlusPC with *Switcher* allows MS-DOS

MS-DOS Emulation



	Mac II	Mac SE	Mac Plus 512K
AST Research	Mac 286 (80286)	Mac 86 (8086)	
PerfecTek			MacPlusPC (8086)
Dayna Communications	MacCharlie (8086)	MacCharlie (8086) attaches to serial port	

applications to share information with Mac programs through the Clipboard. Hard disk users can set up a portion of their disk space for MS-DOS files. PerfecTek offers translation utilities and a direct Mac-PC link utility to make file conversion easier.

286 for Speed

AST Research has introduced PC coprocessor cards—the Mac86 and the Mac286—for the Mac SE and Mac II, respectively. AST designed the cards in concert with Apple and Phoenix Technologies, the developer of the PC basic input/output system (BIOS) ROM that most of the PC clone manufacturers use. Designed for the card slot in the Mac SE, the Mac86 uses the Intel 8086 microprocessor and contains a floppy-disk controller that works with Apple's PC Drive 5.25. The card contains no memory and uses up to 640K of the Mac SE's RAM for processing. The Mac86 operates at approximately the same speed as a PC XT and supports the IBM Monochrome Display Adapter (MDA) and Color Graphics Adapter (CGA) video standards.

Designed for the Mac II, the Mac286 is essentially an IBM PC AT on a card. It contains an Intel 80286 processor, a slot for an 80287 math coprocessor chip, 1MB of RAM, and a floppy-disk controller for Apple's PC Drive 5.25. The Mac286 emulates the same video modes that the Mac86 does, with the addition of the Hercules Graphics Card (HGC) standard.

Both cards operate similarly to PerfecTek's MacPlusPC: an application allows the Mac to run MS-DOS in a window on the

Emulation Options

While all Macs except the 128K can take advantage of 8086 PC emulator cards, only the Mac II can emulate an AT-class machine using AST's Mac286 card.

Mac screen, just like any other Mac application. Both cards offer a complete menu, desk accessories, and mouse support, as well as cut and paste operations. In addition to attaching the Apple PC drive, you can set aside a portion of the Mac's hard drive for MS-DOS files. By creating a Mac-based HFS folder that acts as an additional PC drive, users can copy files easily between the two operating systems. You can also configure the Macintosh mouse to emulate the MS-DOS Microsoft Mouse.

The Mac286 offers full use of the Mac II's color capabilities. When configured for the CGA video mode, the Mac286 displays colors in appropriate shades of gray. While ensuring that entertainment-minded users will be able to play PC games on the Mac SE, this configuration also allows many PC-based graphics programs to use the CGA for displaying graphs.

Users of the Mac286 should find it compatible with version 3.3 of MS-DOS and with OS/2, both announced in March 1987 along with IBM's new Personal System 2 (PS/2). OS/2 with Windows will both provide a closer match to the Mac's graphics-based interface than the current character-based MS-DOS environment, and give users the ability to access much more memory than is currently available under MS-DOS. Unfortunately, OS/2 will not run on the Intel 8086, but requires the 80286 chip or the 80386 chip to run. Therefore, if you are using MacPlusPC or Mac86, you will be limited to MS-DOS 3.2 or 3.3 opera-

tion. However, because OS/2 won't replace MS-DOS as the dominant PC or PS/2 operating system for at least a year or two, users of 8086-based coprocessors won't have to worry about obsolescence for a while.

Reading PC Disks

The third option for Mac users who want to access MS-DOS files is to attach a PC-compatible drive that reads and writes DOS-formatted disks—and, in fact, can format the disks too. PC-compatible drives often have file-transfer and file-translation utilities that enable you to translate file formats as well as to copy the files from one type of disk to another.

Aside from Dayna's MacCharlie, which has a 5½-inch drive built into its chassis, the first PC drive available for the Mac was Drive 5.25 from Abaton. Drive 5.25 attaches to the Mac's floppy-drive port and allows you to copy files between the two disk types. Later Dayna introduced the FT-100. This drive looks similar to the MacCharlie, and like Abaton's Drive 5.25, the FT-100 lets you transfer files between the two media using a separate transfer application. Since then, two additional drives have become available—one from Apple and another from Dayna.

The Apple PC Drive 5.25 is a 5½-inch disk drive that works with either the Mac SE or the Mac II. In addition to buying the drive itself, you must purchase a disk-controller card from Apple. You need the Macintosh SE-Bus PC Drive Card for the Mac SE and the Macintosh II PC Drive Card for the Mac II. (You do not need the controller card if you buy the drive to use with AST's Mac86 or Mac286 card.)

File Transfer Options

With these products Mac owners can transfer files between DOS-, OS/2-, and Mac-formatted disks.

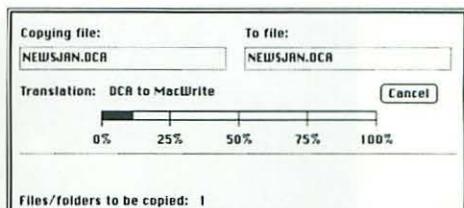
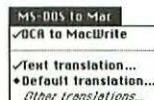
Along with the PC Drive 5.25, Apple includes a file-transfer and file-translation utility called the Apple File Exchange, which works not only in the MS-DOS and Mac environments but also in the Apple II ProDOS environment. The utility is unique because Apple offers it as an application shell. At its simplest level, the Apple File Exchange transfers binary and text files and also translates between *MacWrite* and IBM's Document Control Architecture (DCA) format. The utility also provides batch-translation capabilities that speed up the conversion process.

Apple is looking to other vendors to write additional translation modules for different formats. Already, DataViz plans to offer some of *MacLinkPlus*'s file conversions for the Apple File Exchange.

For Mac users, Apple will provide the Apple File Exchange free in an upcoming software update and will bundle the utility with all new Macs as part of the System Tools disk, so you won't even need to buy the 5½-inch drive to get the program.

DaynaFile, Dayna's MS-DOS drive option, is unique because it runs on the Mac Plus, the Mac SE, and the Mac II. DaynaFile utilizes not only the standard 360K 5½-inch MS-DOS floppy, but also the 1.2MB 5½-inch AT floppy format and the 760K 3½-inch floppy used with the PC Convertible. The standard model comes with the 360K PC disk drive.

DaynaFile attaches to the Mac's SCSI port and functions transparently as an additional disk drive. Dayna offers the same file-format conversion program with DaynaFile as it does with MacCharlie and FT-100. DaynaFile's unique ability to work



PC to Mac

Apple's File Exchange lets users translate files from one format to another. Apple will provide MacWrite, DCA, binary, and text formats; third parties will provide others.

with three of the MS-DOS disk formats—it does not yet work with the high-capacity 3½-inch floppy-disk format found in the new IBM PS/2 machines—makes it an excellent choice for businesses that have diverse PCs.

Apple is also reported to be developing a disk controller chip that, once installed in the Mac SE and Mac II, will allow those machines to read DOS-compatible 3½-inch disks.

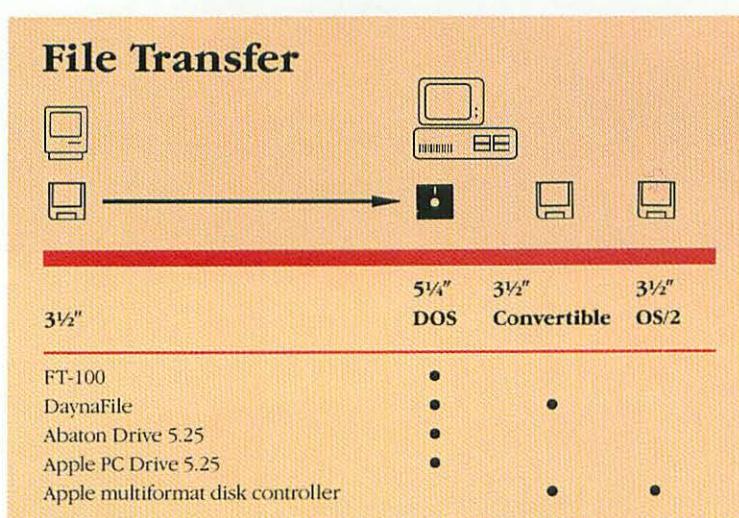
On the Horizon

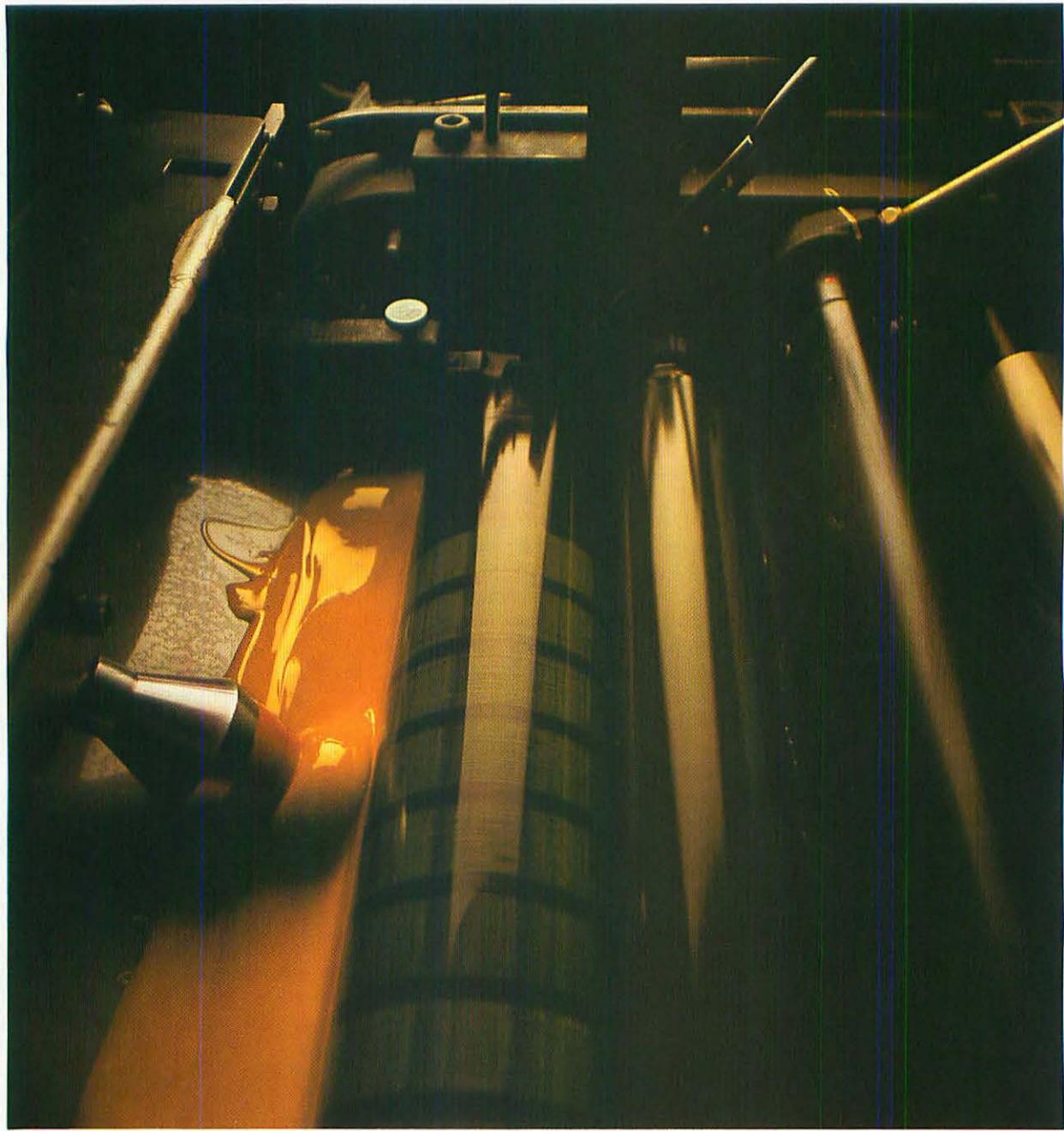
The three paths to MS-DOS connectivity—networks, MS-DOS coprocessors, and PC-compatible disk drives—offer options that work today.

In the future, as networked machines approach the plug-and-play concept that Apple initiated with its AppleTalk network—and as Microsoft and IBM solidify their plans for OS/2—the sharing of files, peripherals, and message systems will become much more transparent. As the Mac matures, and as applications migrate from Mac to PC and vice versa, common file-formats will become more prevalent.

Eventually you should be able to buy a Mac for an IBM-dominated environment, or a PC for a Mac environment, without worrying about application and file incompatibilities. You will be able to work on the machine with which you're most comfortable—the one that offers the right blend of performance and productivity—without feeling isolated. □

See *Where to Buy* for product details.





*The inking fountain
of a Heidelberg four-
color offset press
applies yellow ink to
rollers that transfer it
to the printing plate.*



First Edition

*A print-services primer
for the beginning publisher*

by Suzanne Stefanac

So you've finally finished that newsletter, pamphlet, brochure, invitation, or book. The desktop publishing software worked beautifully, and the document looks great. Now you're ready to present it to the printer.

Or are you? For those who have never ventured inside a printer's shop, the experience can be maddening. Good printers have mastered a complex and precise craft, and most assume that their customers will be familiar with the basic jargon and conventions of the trade. Failing to communicate clearly with your printer can often mean the difference between a fine product and a costly disaster.

Unless you ask, for instance, the printer might not bother to show you the cheaper types of paper or tell you that a more standard page size could substantially lower your overall cost. No one will volunteer to tell you that the color snapshot of the company picnic is going to look like a detail of the moon's surface once it's shot as a halftone. Or that foregoing a color headline could halve your printing costs. Or that the shop down the street could do the job in one day.

The bottom line is that printing is probably the single most costly item in any desktop publisher's budget. Without at least a basic understanding of the printing process and the options available, you could easily end up watching the money

you saved through electronic design and pasteup dribble away like so much spilled ink.

Types of Printshops

A glance at the variety of printers advertising in the yellow pages is enough to intimidate most first-time publishers, but basically printers can be divided into three categories: photocopy shops, quick-print shops, and larger commercial printers. Each has its own capabilities and limitations.

Simple photocopy shops produce one-color, standard-size reproductions that can be collated, stapled, and folded. These services are cheap and fast, but the quality limitations inherent in the process make photocopying unsuitable for many print jobs.

Better-quality printing, heavier or smoother paper, more than one ink color, specialized folding, binding, and the reproduction of halftone graphics generally require offset lithography. Quick-print presses and commercial shops both do offset printing primarily.

Quick-print presses use a graphic arts camera to create a paper or plastic printing plate that can be used to print a finished product immediately. Fast turnaround and cost-effectiveness are the pluses. In addition, quick printers often allow you to submit work that hasn't been pasted up. On the down side, these services usually cannot print pages larger than 11 by 17 inches, and many don't print more than one color. Large graphics—particularly if they include

sizable solid patches—don't fare well with this method.

Larger commercial presses generally use metal printing plates and produce a higher-quality product. They also offer more options, such as a wider selection of paper grades and sizes, better halftone reproduction, the ability to print four-color graphics, a choice of binding styles, and the ability to print alternate versions of a publication (in case, for example, you want to produce different editions for different localities). Commercial presses usually require more time because they must first shoot negatives of your text and graphics and then assemble, or *strip*, them onto printing flats.

Printshop Shopping

Once you've decided what type of printing service is appropriate for your job, you can start shopping for a printer. Time spent on this activity will be richly repaid. Finding someone about whom you've heard good things, whose work you've seen and admired, and with whom you feel comfortable puts you ahead of the game from the start. As Jim Smith of the Laser's Edge, a laser printing service in Oakland, California, puts it, "Quality printers do quality jobs, and half-assed printers do half-assed jobs."

Price is another reason to compare printers. Toby Towland-Jones co edits and publishes *Benefit*, a journal for nonprofit organizations. "We shopped our mock-up

around quite a bit," he remembers, "and some estimates were double others." Print prices can even vary considerably at the same shop, depending on how heavy its schedule is at a given time.

The process of choosing a printer isn't difficult once you understand a few of the main concerns that need to be addressed. Especially if you're a new publisher, the best time to start talking to printers isn't after you've pasted up your work, but somewhere in the middle of the design process—when you have a good idea of what the project will look like but have not yet put too much effort into working out the details.

Tibor Harsanyi of A-1 Print and Copy in South San Francisco stresses the importance of early consultation: "At the design stage, we can give customers valuable tips that eliminate wasted work." As examples, he cites cases of clients not realizing that enlarging laser fonts would exaggerate their jagged edges, that shrinking digitized images might render them unreadable, or

that tabs rather than spaces should be used to line up columns of figures or other material. In addition to helping you avoid such pitfalls, early consultation with your printer enables the shop to schedule time for your job and to order any special materials you may require.

The best way to approach potential printers is to bring along a mock-up of your final product. This can be a sketch or a dummy showing size; number of pages; any folds required; and the number, placement, and type of graphics. Since you may find that you and your printer speak a different language, using a mock-up will help ensure that you communicate exactly what you mean.

Stock Comments

Since paper costs can constitute as much as 50 percent of your final printing bill, paper stock should be one of the first items you discuss with your prospective printer. Weight, finish, and color are obvious considerations. Bringing a sample of some printed matter that's similar to what

you would like will help you and your printer decide which stock is most appropriate for your publication.

Whether to print on inexpensive bond or an elegant, coated book paper depends on your intent and your pocketbook. The reproduction quality will depend on how the paper takes the ink. Remember that expensive paper is not always the most attractive. Another consideration is that standard sheet sizes are always cheaper than odd sizes. Standard sizes will usually be multiples of 8½ by 11 inches. However, if you're committed to a design that can't use one of those sizes, don't give up hope. Since printers often keep odd-size paper in stock to accommodate regular customers with special needs, there's a chance the size you want may rate a "standard" price at a given shop.

Limiting the number of pages in your publication to multiples of four is another money- and time-saver. For example, an 11-by 17-inch sheet printed on both sides can be folded and cut into a 4-page, 8½- by 11-inch pamphlet. Commercial printers often group 8 or 16 pages onto one printing plate, called a *signature*, so setting up your job to conform to those numbers will speed up printing preparation and lower the final job cost.

The Laser Look

If you use a LaserWriter at a copy shop or quick-print shop to print your pages, trying to determine in advance how your layouts will look can be a problem. Using your ImageWriter to print proofs is dangerous, mostly because the LaserWriter prints about two fewer lines per page than the ImageWriter. This difference can completely throw off your formatting, giving you page breaks where you don't want them.

One solution is to fool your Mac into thinking you've got a LaserWriter. Installing a LaserWriter driver in your System file will change your screen display so that what you see on screen is more like what the LaserWriter will print.

Simply drag the LaserWriter driver that came with your system disk into the System Folder. If you're using an old System, this might be a good time to ask your dealer for an upgrade to the latest version. Just make sure you don't use a new driver with an old System. Once the driver is in place, use the Chooser to select the LaserWriter. Return to your application program and remember to select Page Setup from the File menu. If you don't select Page Setup, the Mac won't reformat the screen.

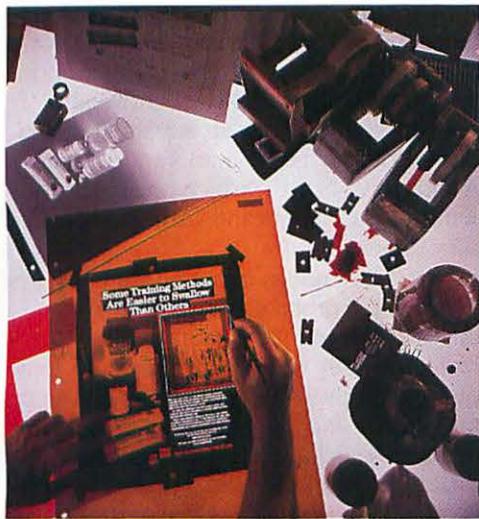
This tip still won't give you true WYSIWYG results, but it's a start. (See "Mac Publishing Tools" in the June issue for more Image-to-Laser ideas.)
—Joe Matazzoni

Graphic Details

From the point of view of print reproduction, there are two types of graphics: line art and continuous-tone art. Examples of line art would include most diagrams, Mac graphics (including digitized images), special headlines, and other graphics that are made up of only black and white elements. You can put line art directly into your layouts.

Continuous-tone images such as photographs or shaded drawings are slightly more complicated than line art, since they include gray tones. Because offset presses generally print with only one color (usually black), printers must use *halftones* to create the illusion of different shades of gray. Halftones are made—either by your printer or a halftone service—by photographing an image through a screen. This converts different gray shades into fields of black dots whose variations in density define the halftone's lighter and darker areas.

Screens for halftones come in varying densities, measured in lines per inch. Newspapers commonly use screens ranging from 65 to 100 lines per inch, while art



A stripper uses Rubylith and orange tape to block out all but the desired elements for the black layer of a four-color ad. This negative will then be transferred to another negative, which will be used to create a printing plate.

books printed on high-quality presses can run up to 300 lines per inch. *Macworld* usually uses a 133-line screen. To determine the screen with which to shoot your graphics, you have to consider the quality of your paper, the ink your printer will use, the resolution of the original image, and your budget. Again, consulting with the printer is imperative.

For most desktop publishing jobs, halftone positives, known as PMTs (photomechanical transfers), provide adequate quality and save money. In the PMT process, a paper negative is shot and then a chemical process is used to transfer the image to a paper positive. You can then simply paste this positive onto your camera-ready layout.

"If you decide to use PMTs for your artwork," advises Jim Morton, a writer and publisher with many years of printing and photolithographic experience, "keep in mind that images tend to print darker. If you take your pictures to a reproduction house yourself, tell them you want the PMTs 'with shadow and highlight adjustment,' because you will be printing from them. You should also avoid using a screen finer than 100 lines if you are printing from PMTs. A 133-line screen will look better to your eye, but it won't look so hot to the camera that has to reproduce it." If you plan to use a quick printer, you should be aware that most quick shops can't accu-

rately reproduce photographs that are dark or that depend on shadow detail. High-contrast graphics work best.

If image quality is an important consideration for you, halftone negatives are the way to go. One advantage of this method is that you don't have to worry about getting the halftones made yourself. In most cases your printer will make the negatives and then *strip in* the halftones—tape them onto the page negatives so that they show through precisely cut openings. In large part it's this stripping-in process that makes the use of halftone negatives more expensive.

If the original graphic is not the correct size for your layout, you can have it scaled. Be particularly careful with semantics here. Telling a printer or photostat house that you want your image at 25 percent means you want it to end up one-quarter the original size. To blow up a picture to twice the size of your original, ask for a 200 percent enlargement. Keep in mind that photos lose detail as they shrink, and that enlarging tends to exaggerate flaws. If you're sizing rectangular images, be sure to calculate the effect on *both* dimensions. Neglecting to do so is a common error, resulting in pictures that don't fit their intended windows.

Because you can sometimes cut expenses by having several halftones shot at the same time, the printer may suggest *ganging* images, which means exposing them as a group, with the same screening and scaling. The printer can help you decide whether or not your images are similar enough in quality and intensity to be ganged.

Images that *bleed* (run to the edge of the page) require special consideration. Full-page images will have to be printed on larger sheets of paper and then trimmed, because presses do not print to the edge of the sheet. Printers should always be consulted on bleeds, particularly when they fall on the top of a page, since that is usually where the press grips the pages.

The Estimate

After you've worked out the physical concerns of folding, collating, and binding (again, referring to your sample will guarantee that the printer understands what you want), you are ready to discuss print run and price. If a job is fairly standard, some printers offer quite reasonable packages. Be sure to discuss at what print runs the printer offers price breaks. It may be to your advantage to order more copies than

you had originally intended. Damage, loss, or a sudden increase in demand could mean going to press a second time, which is always expensive. Once the plates are made for your job, printing a hundred—or even a thousand—extra copies may not cost that much more.

Pay attention to whether the printer offers you an estimate or a contract offer. In practice, few printers offer firm quotes until they see your mechanicals—the final camera-ready copy. As mentioned before, be prepared for a wide variety of quotes. Also be prepared to spend some time accumulating and comparing them, since each printshop has its own method of calculating cost.

It's not a bad idea to ask if you can arrange for a 30-day payment schedule. That way, if there are problems with the proofs or the final copy, the portion of the fee you've retained will give you some leverage.

Pasteup

Once you have settled on a printer and agreed on an estimate, it's time to prepare your mechanicals. The first step involves printing out the pages of your document in their final form. Dot matrix output will be too jagged, even if you shrink the image, for any but the most basic printing jobs. As for laser output, Carl Haeberle of Mac Studio in San Francisco stresses the importance of using laser-printed proofs: "The biggest problem for casual users is



A bindery machine mechanically gathers signatures for saddle-stitching and trimming.

that they proof at home with their dot matrix printers and then, when they bring their disks in to have final pages printed out on the laser, the justification goes sideways or columns don't line up. Even without those problems, the whole look, the weight of the page, is so different. If you're going to use a laser printer for your final product, then your dot matrix setup is good only as a paper weight." (See "The Laser Look" for tips on circumventing this problem.)

Deciding which paper to use for your final output depends on a number of considerations. "I enjoy working with laser-printed type," says lithographer Mitchell Taylor of Alex Photo Litho in San Francisco, "because it tends to have a lot of blackness in it. Dot matrix printing comes out gray, and that causes trouble when you're making a negative. A big problem with laser printing, though, is that if the page gets dirty, there's nothing I can do. Cold type is set on standard photosensitive typesetting paper, which can be cleaned with solvent." Some people use enamel-coated stock for laser printing, which is a little easier to clean than regular uncoated paper, but it does not completely solve the problem. If the paper is too slick, the toner can chip off, and it can come up with the solvent.

Jim Smith of Laser's Edge finds other problems with the enameled papers:

"We've experimented with putting enamel and clay-coated papers through an automatic wlexer and it's true that the wax doesn't soak through them, but sometimes they don't feed properly. What we like is a very white, very smooth, 24-pound stock. If you use a hand wlexer, there's no bleed problem anyway."

Ted Nace, coauthor and publisher of the book *LaserJet Unlimited* (Peach Pit Press, 1987) and a columnist for *Publish!* magazine, recommends using a 70-pound stock that's enameled on both sides: "The coating on one side gives you a surface for printing; on the other side it keeps the wax from soaking through. The smoothness can be a problem, but it helps keep the print sharp." Nace adds a laser printing tip: "When printing stuff that will go to an offset lithographer, you want the type to be very light, because jaggies will merge together when the printer shoots a negative. This tends to make the type appear heavier. If your laser printer has an adjustment, use the light setting."

If your laser-printed pages are complete, including graphics, you may be able to submit loose sheets to the printer—particularly if you're using a quick-print shop. However, if you need to add, delete, resize, or otherwise change any elements on your basic printout, you'll need to paste up your pages.

Your printer can give you premarked pasteup boards that clearly show the borders of the active image area for your print job. You can also purchase lightweight pasteup boards at any art supply store and put in your own crop marks and fold lines. Avoid heavy boards, which present problems for the camera and are an unnecessary expense.

If you're not an experienced publisher, you'll probably want to lay out the pages of your publication in *reader order*—as they will appear. However, some quick-print shops require that you paste up the pages using *imposition*—the arranging of pages so that they'll be in the proper order once the sheets are folded and assembled (see Figure 1). Quality shops will arrange the pages for you, but you can save money by doing it yourself. This is something you must discuss with your printer in advance; ask the printer to give you a simple dummy, folded and marked with page numbers, and then work from that.

When you begin pasting up your mechanicals, it's important to remember that camera-ready copy must be kept absolutely clean. Many printers complain that novice publishers often come in with smudged, sticky boards. The best adhesives to use for pasteup are wax and spray mount. Rubber cement produces very messy results. Professional production houses have wlexers that are easy to use, safe, and neat, but these machines are too expensive for most desktop publishers. Getting consistent results with a hand wlexer requires experience, but for anyone contemplating regular pasteup jobs, this is an excellent option. The drawbacks include dangerously hot wax and the toxic solvents necessary to remove wax from your hands. Wax sticks are cheap, but they can leave visible lumps under the paper, and they can't be used on bond paper because the wax will seep through and smear the image.

Spray mount—particularly the repositionable type—offers a convenient alternative. The fumes, however, can be hazardous, and the excess spray can gum up your floor and work surfaces. These problems can be minimized simply by holding the elements to be sprayed inside a cardboard box positioned just outside your main work area.

When you lay down your page elements, carefully align them with the grid on the board. PMTs, clip art, and original

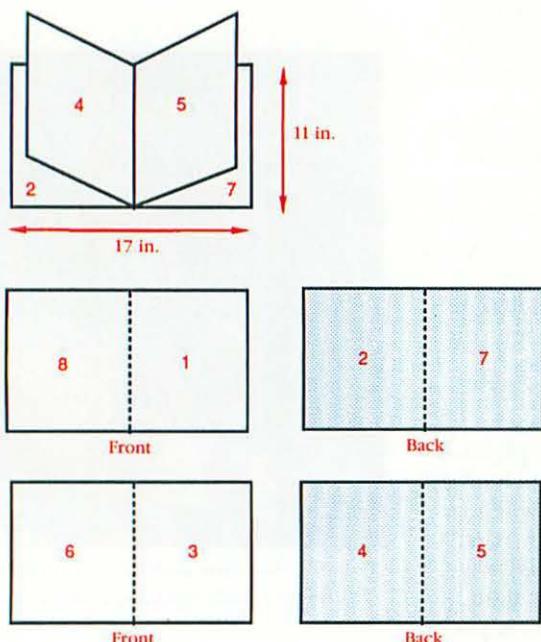


Figure 1
Although many commercial printers prefer single-page mechanicals that are clearly numbered in reader order, quick-copy shops may require you to paste up pages according to an imposition so that your pages will be in the proper order once the printed sheets are folded and cut. Shown here is the proper imposition for a double-sided eight-page newsletter printed on 11- by 17-inch sheets to be folded and assembled into an 8½- by 11-inch format.

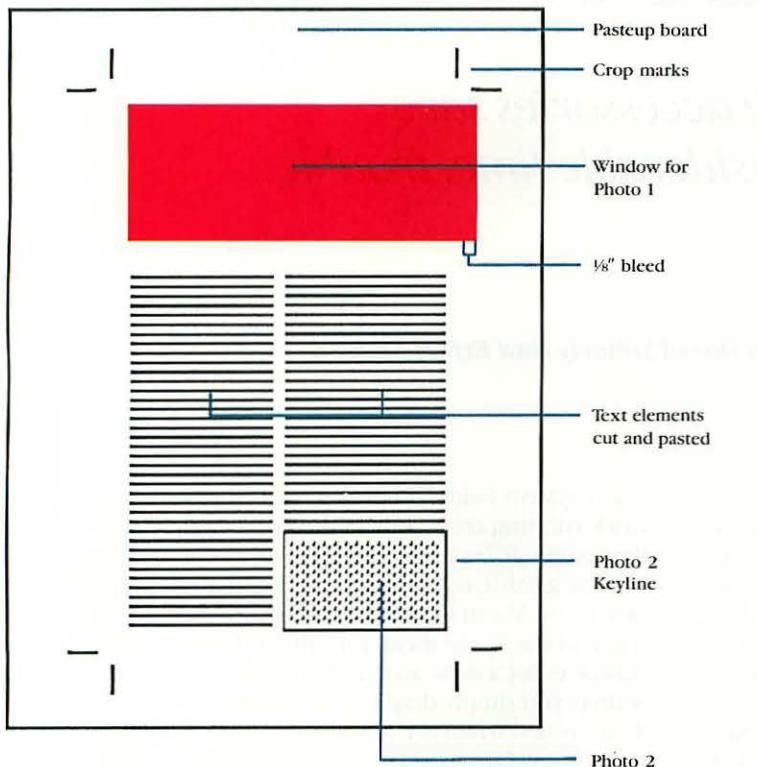
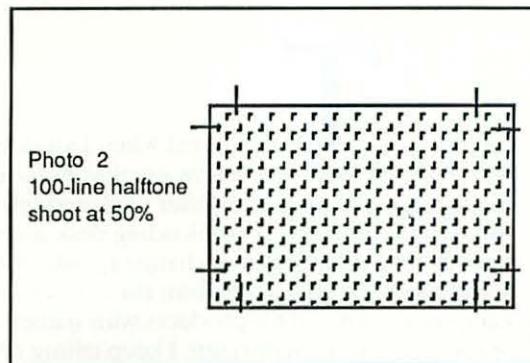


Figure 2

A mechanical ready for the printer. Page size is indicated by crop marks, text elements are pasted up neatly, and two red windows have been placed where halftone negatives will be stripped in. Photo 2 is mounted on a separate board, ready to be shot as a halftone. The instructions tell the printer to shoot it at 100 lines per inch, and reduce it to half the original size.



line drawings can be pasted right onto the mechanical. If you've printed fine-line boxes—or *keylines*—to define the spaces for graphics, be careful to conform to those keylines exactly.

For halftone images, you must put black or red “windows” in the appropriate places on your page mechanicals. Because they do not reflect light for the printer's camera, the windows leave precise openings on the page negatives where the printer will strip in the halftone negatives prior to platemaking. Some printers prefer to cut the windows, but doing it yourself is cheaper. While most printers say that laser-generated black windows are not dark enough for the photolithographic process, some people use the LaserWriter and touch up window imperfections with a red felt-tip marker. The camera reads the red as black. The more expensive but time-tested technique is to use adhesive block-out film, such as Parapaque or Zipatone. Either should be cut to the exact window size and attached to the mechanical.

Once you have fully proofread your mechanicals, you may want to place tissue

overlays on each board. These protect your mechanicals and are useful for writing notes to identify your halftones for the printer. Each graphic to be shot as a halftone should be mounted separately with specifications noted beside it—the number or letter used to key it to the finished product, the number of lines per inch for the halftone screen, and the enlargement or reduction percentage, if any. Crop marks indicating the portion of the graphic to be used should also be drawn on the mounting board. (See Figure 2 for examples of a pasted-up page and a mounted photograph.)

Check your mechanicals one last time. Once they have been submitted to the printer, any changes will cost you money and delay printing.

Checking Proofs

It's a good policy to tell your printer you want to see proofs after the mechanicals are shot. Quick-print services will probably provide only a photocopy, but

commercial presses offer *bluelines*—contact prints of the fully stripped flats. This is your last chance to check for correct placement of graphics, proper color registration, proper imposition, typos, and trim problems.

If changes do need to be made, discuss with the printer which of you will bear the cost. If you require another proof, keep in mind that it will almost certainly push back the print date. Once you sign the proofs, you authorize the printer to go to press.

For major jobs, you may want to make a press check after the first sheets have been printed. Check the paper stock, ink color and density, print registration, and imposition. Point out any flaws to the printer and determine whether or not they are worth correcting.

Finally your pages are run off the press, and you can breathe a sigh of relief. You've navigated the complex printing process and emerged with a professional-looking publication. And best of all, the second edition will be even easier. □

A DA in the Life

*In which desk accessories save
our hero considerable time, trouble,
and expense*

by David Simerly and Erfert Nielson

They laughed when I sat down with Font/DA Mover. My fellow employees have always made fun of me for staying after work and browsing through CompuServe, downloading desk accessories until my eyes glaze over; exchanging disks with those scruffy-looking characters from the user group on campus; sending off for products with names like *SmartScrap* and *CheapPaint*. I keep telling my co-workers that collecting desk accessories isn't a frivolous pastime; why, I've accumulated a collection that lets me do everything from file maintenance to scheduling, all without leaving whatever program I'm using.

My office mates could learn how to work more efficiently if they'd only listen to me, but when I talk about my DAs they just snicker and head back to their Macs, switching from one ponderous application to another—when their Apple menus could be built for speed. Well, let 'em laugh. Little do they know that DAs have saved our corporate assets more than once. Take last Monday, for example....

8 a.m. I arrived at work early, since I had a busy week ahead of me at Superfluous Commodities, Inc. We're rolling out some innovative products this year, and as head of market research, I've got my hands full. The test-market figures for our new gourmet pet food line were on my desk, and the prospects looked good: Canine Cajun Cuisine was a hit, especially the Blackened Beef Byproducts. The Kitty Sushi series was a smashing success, with the possible exception of Kappa Maki Treats. The Gerbil Tapas didn't do too well, though. I must say I was a little hurt, since that one was my idea. C'est la vie, I guess.

Bell, Clock, and Calendar

After perusing the figures, I turned on my Mac, ready to put in a full morning's work. To my dismay, it was already 8:56. Ever since I installed *JClock* in my

Mac's System Folder, I have an unobtrusive little digital clock running constantly in the upper-right corner of the screen. *JClock* lets me be subtle about my clock-watching habit, but more important, it allowed me to delete the Alarm Clock desk accessory, freeing up space in the Apple menu for other DAs (see Figure 1). *JClock* is not a desk accessory, but rather an Init resource; you simply drag it into the System Folder and it's activated when the Mac is turned on. *JClock*, like many of my DAs, is available in the public domain.

9:00 a.m. As I was pondering whether Guppie Rijsttafel would sell in Peoria, my Mac began to beep frantically, drawing my attention to a message on the screen. Things can get pretty hectic around here, so I've installed Imagine Software's *Smart Alarms*, a DA that pops a reminder onto the screen at a specified time (see Figure 2). This message read, "Market research report due by 4:00 this afternoon. Don't forget!" I groaned as I remembered my forgotten task—saved by *Smart Alarms* again!

I clicked the "Thanks! I've dealt with this now" button and then opened *Appointment Diary*, a DA that's included with *Smart Alarms*, to see if I had any other deadlines. Thankfully, the report was my most pressing task, but *Appointment Diary* contained a number of helpful notes that I had entered the week before and had subsequently forgotten about. I noted that I needed to paste a chart of the test-market figures into the report. At least I had that part of the job sewn up; I'd created the chart in *Excel* several days ago. To make sure I wouldn't forget to include the chart, I dragged the cursor across that message and then pressed ⌘-R to turn the calendar entry into a *Smart Alarms* reminder. *Smart Alarms* popped up, and I set



the reminder for a few hours later. I figured that would give me enough time to finish typing the report, barring any disasters.

Security Measures and Housekeeping

9:15 a.m. I needed a morning cup of java to fortify myself for the task ahead. Before leaving my office, I pulled down *ScreenLocker*, a public domain DA I'd gotten at a user-group meeting, and entered my password. I like *ScreenLocker* because it prevents people from other departments from coming over and tying up my machine with their jobs—which happens all too often. My office mates like *ScreenLocker* because it prevents *Smart Alarms* from going off while I'm away from my desk and annoying them with its persistent reminder bells. My Mac protected, I set off for my much-needed coffee.

I returned to my office and typed in my password. As *ScreenLocker* returned my Mac to full operation, I half expected to be nagged with another *Smart Alarms* reminder (Mondays are like that sometimes), but my Mac simply sat and waited for my next move. I wanted to start *MacWrite*, and I knew what folder it was in on my hard disk, but rather than opening all those windows, I simply selected *DiskTop* from my Apple menu and chose *MacWrite* from the applications I had installed in the *DiskTop* menu. A single click on the menu bar and a new *MacWrite* document sprang to the screen.

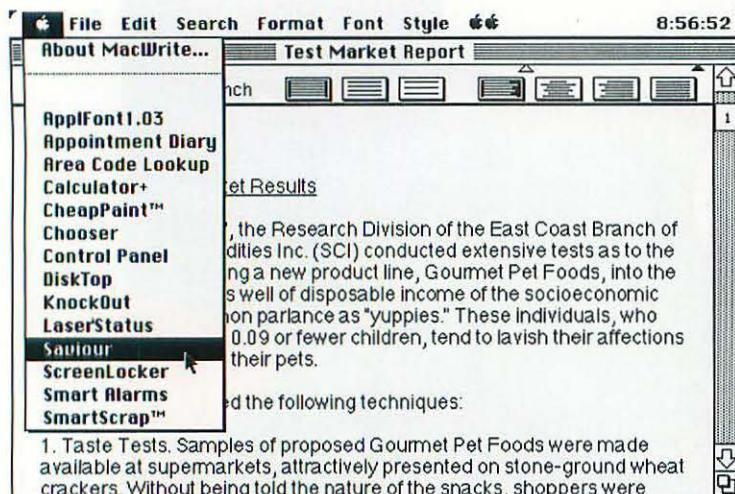


Figure 1

You can install up to 15 desk accessories under the Apple menu. The desk accessories are installed in a System file; any program run with that System will offer those DAs.

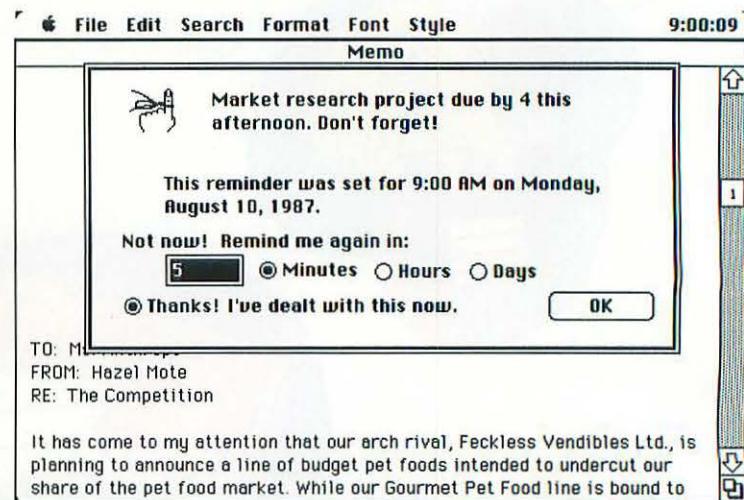


Figure 2

Whether you're absent-minded or just too busy to remember all your appointments, Smart Alarms can save the day. This helpful DA pops reminders onto the screen at specified times.

9:30 a.m. Once in *MacWrite*, I closed the blank document so I could open my notes on the various proposed product lines. I decided to begin with the figures for Kitty Kaviar. Now what folder had I saved the file in? Once again I pulled *DiskTop* from the Apple menu. The *DiskTop* desktop appeared, showing an icon for my hard disk, the Trash Can, and a number of buttons. I double-clicked the hard disk icon, and the list of the files on my hard disk appeared, along with more function buttons: Copy, Move, Delete, and Drive (see Figure 3). First I double-clicked my New Products folder; the file wasn't there. Next I opened my Marketing Plans folder; not there either. I really must take a memory-improvement course.

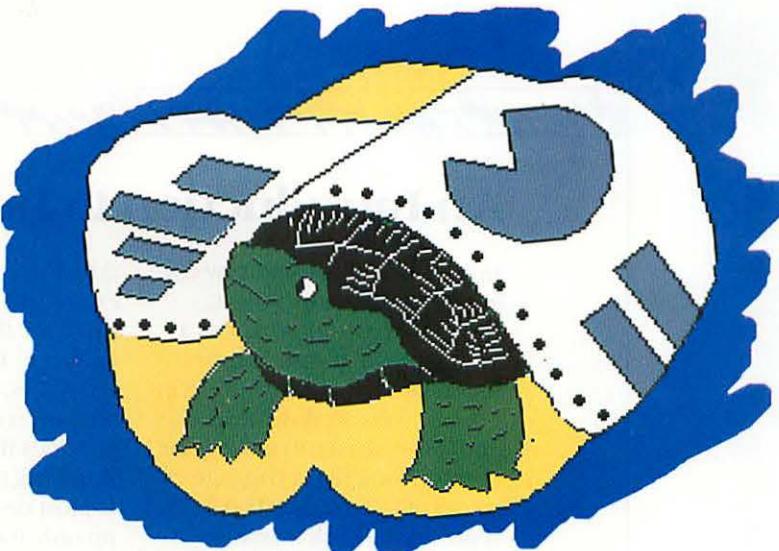
With a sigh I clicked the Find button, and a dialog box appeared so I could enter a search string. I typed in the word *kitty* and changed the search criteria from Match Any to Match Start. I figured that I had probably started the file name with *kitty*, so that would be the most likely way to find it. I clicked the Search button, and soon a diagram of the file structure appeared in the Find window. My hard disk's name and icon appeared at the top of the structure, and a series of folders and names led downward to the file name *Kitty Kologne*. Nope, old product. I clicked the Search button again and *DiskTop* continued downward through my hard disk's file structure. Soon another diagram appeared with the file name *Kitty Kaviar* at the bottom of the structure. That was the one. For some reason I had stored it in my Product Ideas folder—it must have been the Friday night rush to get home. Anyway, now that I had found the file, I wasn't about to leave it in the wrong folder. I clicked the Go To button and *DiskTop* jumped to the Product Ideas folder and selected the

Kitty Kaviar file for me. Next I clicked the Move button, and when the dialog box appeared I clicked my way up through the structure until I reached my Marketing Plans folder. Next I clicked OK and watched as Kitty Kaviar disappeared from Product Ideas and headed for its new location in the correct folder.

Default Font and Faultless Spelling

9:40 a.m. With disk housekeeping out of the way, it was time to start on the report; I couldn't afford to waste a minute. I noted with satisfaction that another of my DAs had saved me precious seconds. I'd installed *Change Font*, a public domain desk accessory by Loftus Becker that lets you set any installed font as the default font. I always work in Helvetica, so this DA saves me the trouble of pulling down the Font menu and switching from Geneva—the Mac's default font—to Helvetica each time I open a new document. I looked around smugly to see if any of my colleagues had noticed this time-saving technique, but they seemed oblivious, as usual.

11:45 a.m. Soon I was immersed in typing a rough draft of my report. I read the first page and saw just how rough it really was. Due at 4:00 p.m. I glanced at *JClock*, ticking away in the menu bar; it was almost noon. I knew there would be little time for lunch. Not a minute to waste, and no time for mistakes either. I pulled *MacLightning*, Target Software's spelling checker DA, from the Apple menu's bag of tricks. After a second or two the *MacLightning* menu appeared to the left of *JClock*. I pulled down the menu and selected Interactive, in order to check my spelling as I typed.



No sooner had I pounded out two paragraphs than *MacLightning* beeped. The Library window opened up and showed me my mistake. Of course *Kaviar* is wrong; it should be *caviar*. I knew that. I clicked a button to add *Kaviar* to the dictionary so *MacLightning* wouldn't bother with that word again.

But a few moments later, as I was typing, "We should be very careful of ..." I was stumped. How do you spell *litigious*? I was drawing a complete blank. I quickly selected Library, typed *latigeous* and clicked the Phonetic Search control. Soon the Phonetic Search window appeared and there it was, right at the top of the list, *litigious*. I copied the word and pasted it into the document so I wouldn't type it in wrong.

Save Me!

While typing along, I remembered what had happened to me as I was scrambling to finish my last report. I'd been working feverishly on the blasted thing for four hours. It was 5:00 in the morning and I was just about finished. I got up to get one final cup of coffee (I drink a lot of the stuff), tripped over the Mac's power cord, and *pow!* four hours of work down the tubes. In my haste, I'd forgotten to save the document even once. I vowed that would never happen to me again, and it hasn't so far, thanks to a public domain desk accessory called *Saviour*. This DA is definitely a lifesaver: just fill in how often (every *n* seconds or every *n* keystrokes or mouse clicks) you want a document saved, and *Saviour* automatically takes care of this troublesome but essential task. If you're typing along when *Saviour* kicks in, don't worry—text typed during the Save operation won't be lost.

12:30 p.m. With *MacLightning*'s help, I continued for another three pages before *Smart Alarms* interrupted. "Don't forget to add the chart," read the re-

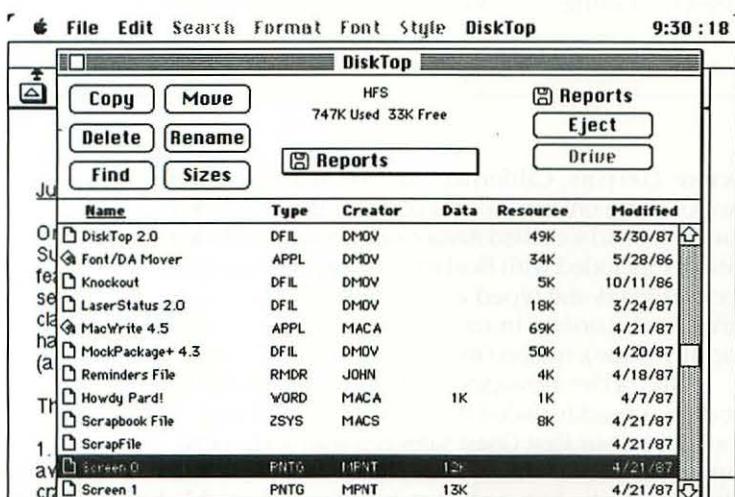


Figure 3

DiskTop lets you move, rename, or even delete files without returning to the Finder. This versatile desk accessory also searches for documents or folders on a hard disk and displays the path to the item it finds.

An Introduction to Desk Accessories

In your travels through any collection of Macintosh disks, you're likely to come across a suitcase icon. If your wanderings take you to online bulletin boards, you can download enough suitcases to make your desktop look like a baggage carousel at La Guardia. The icon represents a desk accessory, a portable application that can be installed in the Apple menu of any Mac program and can run while you're using the program. (Legend has it that the 4-by-4 grid on the suitcase icon represents the Puzzle, a now-extinct DA that was included in early Mac System files.)

The icon is generic, but its contents vary considerably; DAs run the gamut from calculators to graphics applications to games. Some are commercially available, while others are offered as shareware (try before you buy) or in the public domain (free). For a comprehensive list of shareware and public

domain desk accessories, see *Free (and Almost Free) Software for the Macintosh* by Robert C. Eckhardt, Dilithium Press, 1987. In addition to descriptions of DAs, the book provides tips and warnings on installing them.

Most desk accessories take up only 10K or less of memory, allowing you to install several—even on a floppy disk, where memory is at a premium. DAs reside in a hard or floppy disk's System file. Applications opened from that System will contain the installed DAs in the Apple menu. You install or remove desk accessories with Font/DA Mover, which is included on the System disk that comes with the Mac (the Font/DA Mover icon represents a moving van). The following tips will help you use Font/DA Mover to best advantage.

■ As Font/DA Mover's name implies, fonts get top billing.

When you open Font/DA Mover, it displays a list of installed fonts. Clicking the Desk Accessory button switches the display to a list of DAs. To immediately see a list of desk accessories, hold down the Option key when you open Font/DA Mover.

■ Installing or removing desk accessories is easy; simply click the appropriate buttons and the deed is done. Be careful when removing DAs, though—unlike most Mac applications, Font/DA Mover does not ask you to confirm your decision to delete. It's possible to become confused and delete your only copy of a DA by mistake, so always double-check before clicking the Remove button.

■ You can copy or remove more than one DA at a time by sweeping the mouse across a contiguous group in the list or by Shift-clicking several individual DAs (see "The DA Shuf-

minder. Nag nag nag, I thought to myself, as I headed to the cafeteria for a quick bite. I knew my boss would be looking for me—he has a knack for stopping by my desk during those rare periods when I'm away from it—so I called upon *Display Message* to inform passersby of my whereabouts. *Display Message* is a clever little public domain DA that runs any message across the screen, Times-Square style, until you turn it off.

Trusty Sidekicks

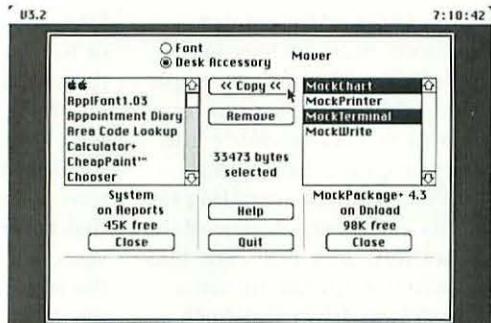
1:30 p.m. When I returned from lunch, I found about a dozen phone messages waiting for me on my desk—all marked *urgent*, of course. Since our company is in California, I had to figure out if any of the calls were from the East Coast in order to return them

before 2:00 p.m., California time. As usual, there were two or three unfamiliar area codes in the bunch. Fortunately, I had installed *Area Code Lookup*, a desk accessory included with Borland's *SideKick*. I simply selected the DA and typed in each unknown area code; *Area Code Lookup* immediately gave me the code's locality (state), region (major city), and time zone.

One of the messages was from a caller in New York, so I quickly dialed the number. Good thing, too—it was our East Coast sales rep with some new survey figures on Kibble with Black Bean Sauce and Mesquite-Grilled Chew-Bones, two items we'd added to Canine Cajun Cuisine at the last minute. I whipped out *Calculator+*, another *SideKick* DA, and made some quick calculations as I talked. (I replaced the Apple menu's standard Calculator with *Calculator+* because I like seeing a record of my calculations on the calculator's "paper tape" display; I can even print out the tape if I need a permanent record.)

The DA Shuffle

Apple's Font/DA Mover lets you copy several desk accessories at once to a System file; hold down the Shift key and select the DAs you wish to copy or delete.



file"). Font/DA Mover displays the amount of free space available, as well as the space required for the selected DAs.

■ When a desk accessory has been installed with Font/DA Mover, the suitcase icon is no longer required. Delete it from your disk to save space. Once you're finished shuffling DAs in and out of a System, Font/DA Mover is also a space-waster; remove it from your disk to regain about 33K (make sure you have a copy somewhere).

■ Font/DA Mover allows you to install up to 15 DAs at a time.

(This number is sufficient for most people, but see "Breaking the DA Limit" for tips on exceeding the 15-DA ceiling.) You may want to parcel out DAs, however, using a customized set of DAs for different applications. You can use Font/DA Mover to install DAs directly in an application. Simply hold down the Option key when you click one of the Open buttons, and Font/DA Mover will open any file on disk instead of only the System, font, or DA files. Using this technique, for in-

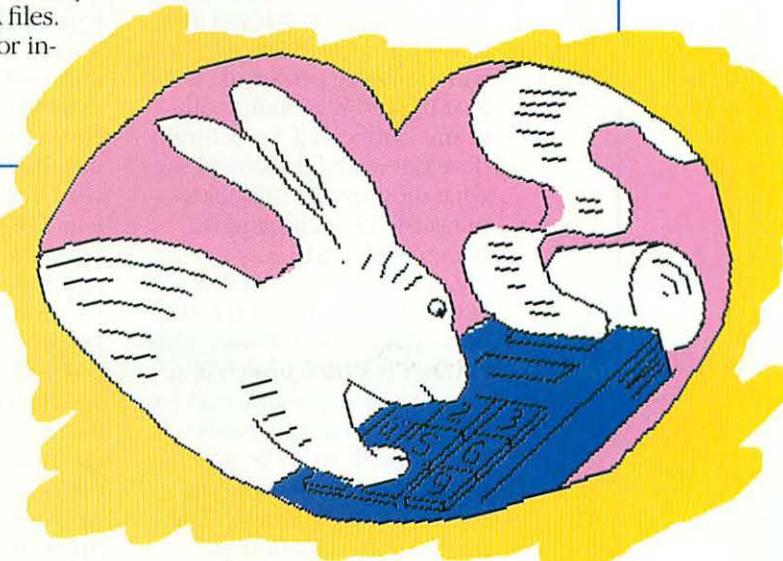
stance, you can install *MacLightning* directly into *MacWrite* or *Word*. If these are the two applications in which you're most likely to use *MacLightning*, there is no reason why it should take up a DA slot in your System file. Another option is to remove the Control Panel from your System file and install the desk accessory directly in the Finder.

■ You can pack a suitcase full of desk accessories, allowing you to open an entire set of DAs at once and install them on a particular disk. Use Font/DA Mover's New command to create a file that can be filled with selected DAs and given a descriptive name. Opening the suitcase icon with Font/DA Mover displays a list of the DAs the suitcase contains.

—Erfert Nielson

An Auxiliary Apple Menu

2:00 p.m. I realized that my painstakingly prepared *Excel* chart was suddenly obsolete, now that I had new information. Time was running out, and I needed to slap a chart into my report. Rather than open *Excel* and redo the chart, I decided to stay in the current document and dash off a new chart with CE Software's *MockChart*, a shareware desk accessory. But I don't use *MockChart* too often, so it wasn't in the Apple menu, which was filled to capacity with 15 DAs. Happily, one of them was *Double Apple*, a public domain DA by Stefan Bilaniuk. Although you can normally install a maximum of 15 desk accessories at once (see "Breaking the DA Limit" for tips on how to add accessories), *Double Apple* lets you get around this limitation by opening DAs that are not installed in the Sys-



tem file. If a DA's suitcase icon is present on a disk, it can be opened with *Double Apple*: select *Double Apple* from the (single) Apple menu, and a *Double Apple* menu appears in the menu bar. A dialog box allows you to open one or more DAs and use them until you quit the application you're using or deactivate *Double Apple*.

Breaking the DA Limit

Macintosh desk accessories allow you to work more efficiently, opening a variety of tools without leaving a program. But with power comes danger. The Macintosh operates through a system called *shared resources*. In other words, the Mac shares common program routines like windows and menus with the programs that run on it. Every new DA you add is just one more program for the Mac to share resources with—one more set of "calls and events" to keep track of. Basically, it's a big juggling act. And every new plate that's added to the juggler's load increases the risk of a crash. This is the reason Apple limited the number of DAs you can install in the System file to 15.

The situation improved dramatically with the advent of the Macintosh Plus. It had more memory, more ROM, and in essence was a better juggler. Now, with the more powerful SE and Mac II, the 15-DA limit really seems outmoded. So naturally, developers and hackers being what they are, techniques to break the 15-DA limit have been developed.

DA Installer+, from Dreams of the Phoenix, lets you install up to 36 desk accessories. This number is a little misleading, however, because although you certainly can install 36 DAs, you probably won't be able to get all of them to work. The reason for this is simple. The main portion of a desk accessory resides in a resource known as a DRVR (short for *driver*), in the System file. There are 47 DRVR slots altogether, only 15 of which (12 through 26) are for DAs. The

others are used for printer functions, SCSI devices, and AppleTalk, and some are simply reserved by Apple for future expansion. *DA Installer+* and other programs like it break the 15-DA limit by installing DA DRVRs in the least critical of the extra DRVR slots. But some DAs just will not operate in, say, a SCSI device driver slot. Such a DA might show up in your Apple menu, but it won't open.

In fact, after considerable effort, I was able to install no more than 22 desk accessories (that worked after installation) using *DA Installer+*. Another problem with *DA Installer+* is that it always opens the start-up volume's System file automatically. And although there is a Switch System command that lets you work on the DAs in a different System file, it usually bombed when I used it. I also found there are fewer problems in the long run if I use one and only one method of installing extra DAs. For instance, if you choose *DA Installer+*, always install and remove your DAs with that program. If you prefer Font/DA Mover, then use that program exclusively. Don't mix and match your programs, or your System file will eventually become corrupted.

Another method for working with more than 15 DAs at a time is to use a program that lets you run uninstalled DAs. One of the best of these is a public domain program called *Double Apple*. It's a DA that lets you run as many as 10 or 12 uninstalled DAs. When you choose *Double Apple*, it lets you select a Font/DA Mover file. *Double Apple* installs the DA or DAs within the selected Font/DA Mover file in a menu. *Double Apple* is great for infrequently used

DAs, such as the Control Panel or Key Caps. Simply install them in a Font/DA Mover file entitled Other DAs. (To create a Font/DA Mover file, click one of the Font/DA Mover's Open buttons and then click New in the dialog box that appears. After you click New, you can name the file and start copying DAs into it as if it were the System file. When you return to the desktop, you'll see your new DA file as the familiar suitcase icon.)

You may encounter problems if you attempt to run multiple DAs from the regular Apple menu and *Double Apple* at the same time. But as long as you're careful, and keep its limitations in mind, *Double Apple* can be a useful addition to the Apple menu.

If you're feeling adventurous, an online article entitled "Installing More DAs" (by William P. Steinberg, CompuServe ID #76703,1027) provides yet another option. It tells how to use *Fedit*, *ResEdit*, and a modified version of Font/DA Mover to install up to 36 DAs in your System file. This clearly written article will teach you a great deal about the Macintosh system and will give you complete control over DA resources. But remember, anything that involves *Fedit* or *ResEdit* usually isn't for the squeamish. Always hack around on a backup copy so you won't destroy an important disk should you make a mistake.

So now you know. There's no reason to restrict yourself to a measly 15 DAs—you can break the limit. Go ahead, all your friends are doing it.

—David Simerly

Charts, Graphics, and a Better Scrapbook

As I was saying, I used *Double Apple* to open *MockChart*, and plugged in the new figures. I created a pie chart, adding titles reflecting the new pet food lines, and copied the chart to *SmartScrap*, an excellent desk accessory from Solutions International. I've replaced the original Scrapbook with *SmartScrap*, which is much more versatile. For example, this DA enables you to create multiple scrapbooks, useful for filing large collections of artwork; *SmartScrap* provides a scrollable, resizable window, an improvement over the Scrapbook's fixed window; and *SmartScrap* lets you select a portion of a scrapbook entry, whether text or graphics.

2:45 p.m. I wanted to insert a note into the chart, so I opened MacroMind's *CheapPaint*, which crams most of *MacPaint*'s functions into a desk accessory (see Figure 4). I added a line of text with *CheapPaint*'s CheapFont text option (those guys at MacroMind certainly have a humble approach) and drew a small illustration to emphasize the chart's projections. *CheapPaint* automatically opens illustrations stored in the Scrapbook; fortunately, it works fine with *SmartScrap*. The altered chart was automatically pasted back into *SmartScrap*, which I opened once I was ready to paste the chart into the report. I decided that the illustration I'd added was unnecessary, so I used *SmartScrap*'s selection rectangle to copy and paste only the portion of the chart I needed. Just as I pasted it in, my disk crashed. I can't place the blame on any single desk accessory—sometimes a crash will occur if a System is crammed full of DAs. I rebooted, reopened the document, and said a prayer of thanks to the unsung heroes of public domain software: *Saviour* had done its job, and I didn't lose a word of the report.

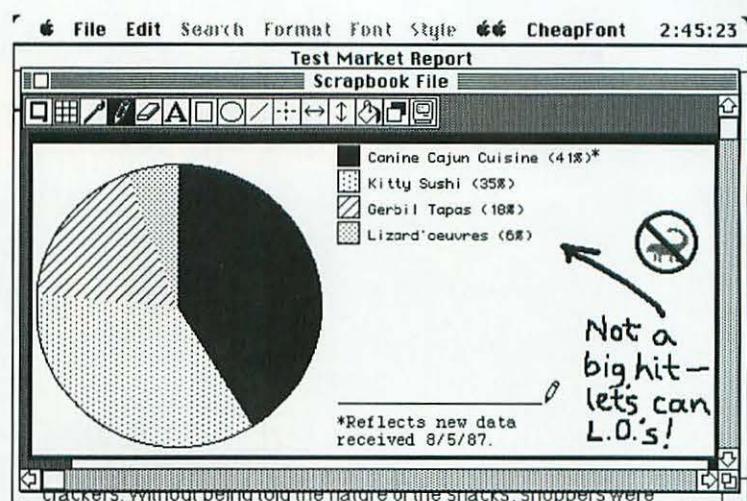


Figure 4

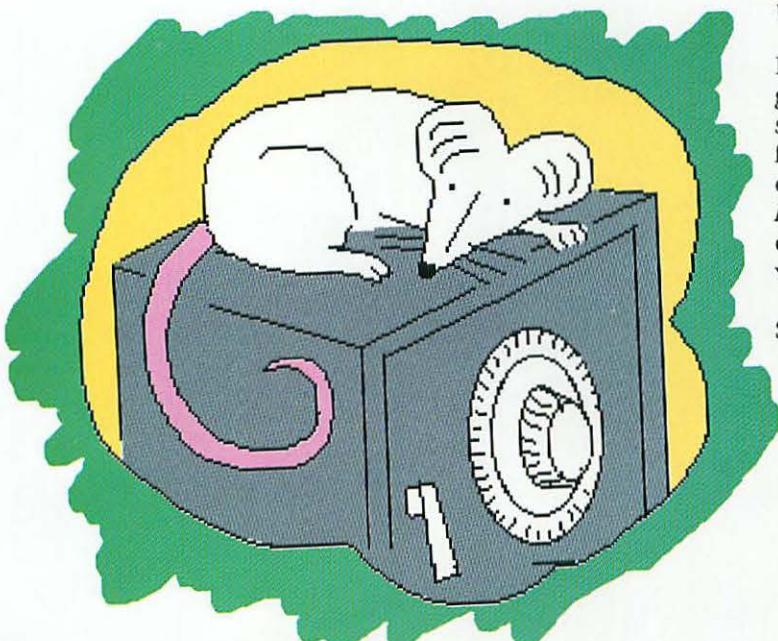
CheapPaint offers many of *MacPaint*'s tools in a 27K desk accessory. Use *CheapPaint* to produce sketches to place in reports or correspondence, or to touch up artwork created with programs such as business graphics applications.

Printing Out and Knocking Off

3:35 p.m. Finally, I was ready to print my report. We've got 12 Macs networked to a single LaserWriter, so it's not unusual for the printer to be busy. To check, I opened *LaserStatus*, yet another CE Software desk accessory (this one came as a bonus when I honorably paid for my shareware copy of *DiskTop*). The *LaserStatus* window informed me that the printer was indeed busy; more important, it told me the name of the person using it. I ran over to that person's desk and begged him to stop printing for five minutes so I could print my report. He obliged, and I had a good ten minutes left before my 4:00 p.m. meeting.

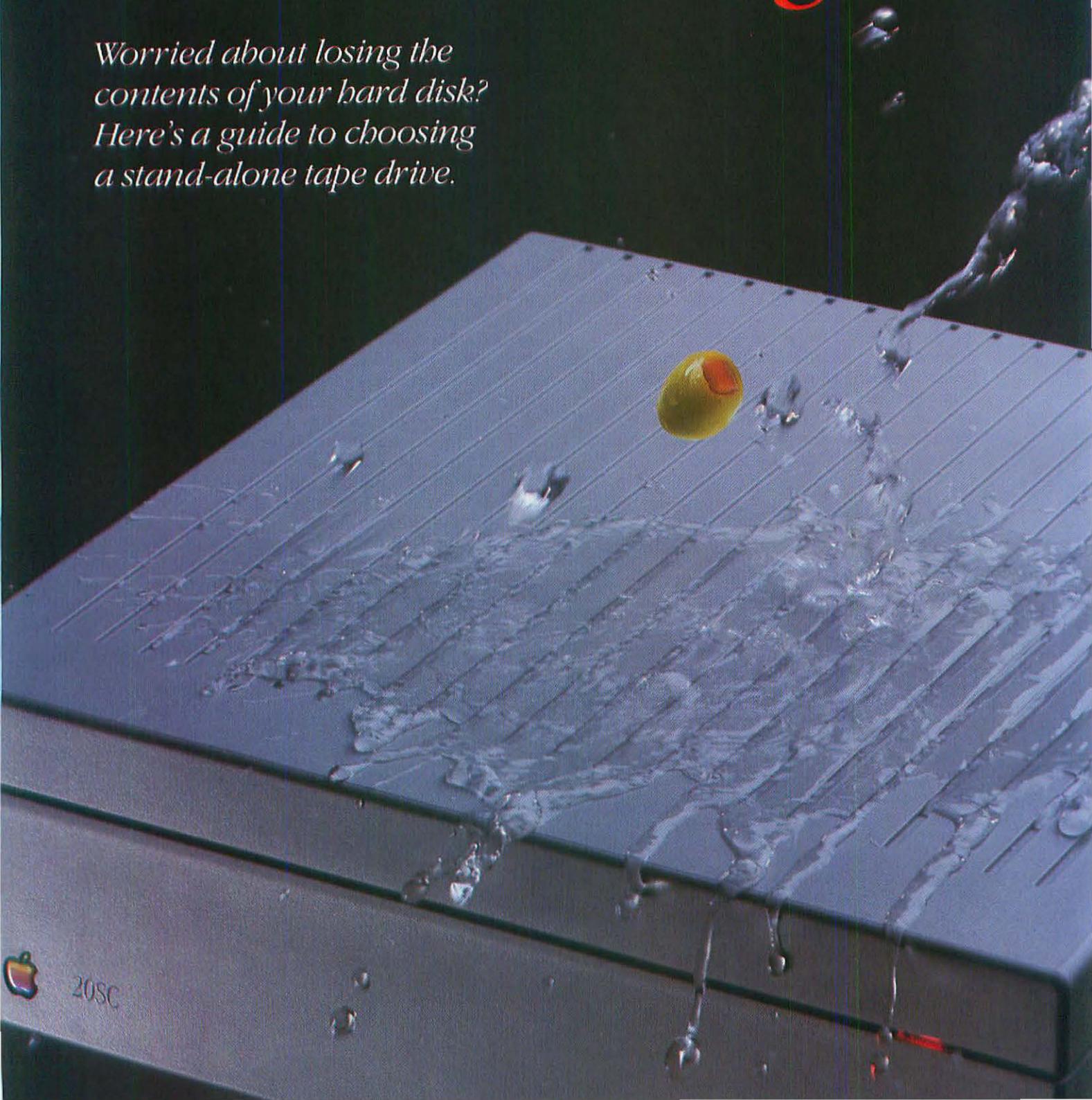
What did I do with that spare time? Need you ask? I used another desk accessory, of course. I played a few games of *Knockout* to soothe my shattered, caffeine-soaked nerves. *Knockout*, a public domain offering from Andy Stadler, presents a paddle, a ball, and a wall of blocks that must be wiped out for a win. If you play *Knockout* at the office, I suggest you turn the sound off; you wouldn't want people to accuse you of not working hard enough, would you? □

See *Where to Buy* for product details.



Safety Net for Storage

*Worried about losing the
contents of your hard disk?
Here's a guide to choosing
a stand-alone tape drive.*





by Lon Poole

Tape drives are hard to beat for hard disk backup. In most cases just one tape provides quick and efficient backup of an entire hard disk; even large disks only require a few tapes. In comparison, most floppy-disk schemes require more floppies than most people use in a year.

This article examines nine tape drives currently available for the Macintosh: the ADON TD-40, Apple's Tape Backup 40SC, General Computer's HyperTape, Mirror Technologies' Magnum Tape 40, The NuData Data File, Peak Systems' Plus-60 Tape, Peripheral Land's MacBack Plus 40, Relax Technologies' Tape 60 Plus, and SuperMac's DataStream. It also looks at the uses of tape drives and explains the features you should watch for when buying one. (For a review of the Mirror and Peripheral Land units, see "Two Tapes in Review.")

Backup King and More

Although most people think of tape drives as backup devices, they have other valuable uses. For example, tapes can be used for distributing large databases or collections of software. A handful of floppy disks can't store nearly as much, and hard disks are simply too bulky—and delicate—to ship in quantity.

Some tape drives allow tapes to be used like very large floppy disks. An inserted tape appears as a mounted volume on the Finder's desktop as well as in Open and Save dialogs. But tapes are generally much slower than floppy disks. In fact, they are so slow as to be unusable on a regular basis. For instance, after you insert a tape, its icon takes two to five minutes to appear on the Finder's desktop.

With or without the tape-as-disk feature, you can use tapes to extend the virtual storage capacity of your hard disk. You can store on tape several megabytes of information that you don't need on a daily basis, then quickly copy it to your hard disk when you do need it (making room on the hard disk by backing up and then deleting files you don't need at the moment).

Evaluating Features

On the surface, tape drives may seem to differ only in style and price. And it happens that the NuData and ADON units are remarkably alike, as are the Peak and Relax drives. Except for these fraternal twins, however, the tape drive family is a diversified lot, as evidenced by the drive mechanism and the backup and restore software used by individual models. Each drive comes with one or more application programs that back up information from disk to tape and restore information in the other direction. The features and user interfaces of this software, more than anything else, give each tape drive its personality.

The tables ("Tape Drives Compared" and "Backup Software") lay out tape drive and software features for easy comparison. The rest of this article explains the features so that you can decide which are important to you.

An Image a Day

There are two basic backup and restore methods. The image method works with an exact copy of the disk surface. The file-by-file method copies files and folders one at a time. In addition, there are variations and enhancements of each basic method.

The image method has two things going for it: it's simple and it's fast. You don't spend time selecting the

Both General Computer's HyperTape and Peak's Plus-60 Tape let you create an image, file-by-file, or incremental backup. Peripheral Land's drive only does an image backup, but it does so very quickly.



folders and files you want backed up or restored, and the program doesn't have to thrash through the disk directory to find each file's disk location. There's no faster way to copy an entire disk.

Because the image method is all or nothing, you can't use it to rescue good files from a partly corrupted disk. Likewise, if anything happens to your backup tape, you probably won't be able to restore any part of the disk from it.

Typically, ADON and NuData image backups do not suffer from the common all-or-nothing syndrome. You can access and restore individual files from them using the Finder. The ADON and NuData drives do a basic image backup, copying the entire disk surface to the tape, including unused disk sectors. For this image to be restored, the destination disk must have at least as much usable space as the source disk had. This requirement may interfere with restoring a disk after formatting it. During formatting, weak sectors are marked unusable, which decreases the usable disk space. Furthermore, restoring an exact image backup to another disk may be impossible, because disk drive capacities vary slightly even among different drives of the same make and model.

The General Computer, Peak, and Relax drives use a faster variation of image backup, which is based on a high-water mark, stopping the backup just past the last sector used. If you've only put 20 megabytes on your 40MB disk, for example, the high-water method takes half the time of the basic method. You're also less likely to have trouble restoring, because the backed-up image will be smaller. Once you've filled the disk—even if you subsequently delete files—the high-water method copies the whole disk, just like a basic image backup.

The Mirror drive uses yet another image-backup variation, the fastest of all. It only copies the disk sectors that are currently in use.

The two fastest image methods assume that the map of active disk sectors, which resides on the disk itself, is accurate. In the unlikely event of the disk map's sustaining damage, only a complete image backup makes an accurate copy for later disk-rescue attempts.

File-by-File Backup

Another method of backup and restore, the file-by-file method, gives you a great deal of flexibility. You select the files and folders that need backing up or restoring. The time you spend doing that usually pays off in a shorter backup or restore session. However, if you pick most or all of the files, the session actually takes longer than an image backup or restore.

If a disk becomes partly damaged, you can often back up the undamaged files using the file-by-file method. Similarly, you may be able to restore some good files from a partly damaged file-by-file backup.

Backing up an entire disk using the file-by-file method is slower than using the image method, but

often pays off by improving disk performance when you restore. The process consolidates fragmented files, whose contents have been dispersed across the disk, into contiguous disk sectors. As a result, the disk can retrieve them more quickly.

Saving the Changes

An important variation of the file-by-file method is the incremental method, in which the backup program decides which files to copy based on when each was last modified. A true incremental backup only copies a file if it has changed since it was last backed up.

Peripheral Land's software defines *incremental* differently. Rather than referring to the date each file was last backed up, it uses a date you specify. Any files changed after that date are backed up. Many other backup programs offer this user-specified date method along with a true incremental method.

Restoring an entire disk from an incremental backup is a complex process. You have one tape containing the whole disk and several update tapes that contain progressively newer vintages of some files that are also on the whole-disk tape. You would usually want to end up with the most recent revision of each file restored to the disk. Most restore applications have you decide which version of a file you want to restore. The software used by NuData and ADON optionally restores the most recent vintage it finds, while a Super-Mac backup always restores the most recent one.

Automating Backups

Manufacturers can't add much value to tape drives with hardware features like autofocus and film advance. They can compete by adding software features, though. For example, you'll find a timer in more than half the backup applications. You set it in advance for the time you want a backup to occur, such as the middle of the night. It's just like taping a movie at 3 a.m. on your VCR while you sleep. An error log keeps track of missing files and other problems so that the backup can continue.

Another useful feature alleviates the burden of making the same complex file and folder selections every time you back up or restore. Instead, you make the selection once and save it as a script. Scripts, or macros as they're sometimes called, make it simple to back up a few files from scattered folders.

A less common feature is the ability to include or exclude a file according to the kind of file it is: system, application, or document. A few programs let you specify by name what to back up or restore. The ADON and NuData programs, for example, let you include or exclude files and folders that begin with, end with, or contain the name fragment you type.

Some programs let you select more than one volume for a single backup. Used in conjunction with a timer, this feature is especially useful for people with partitioned hard disks or multiple hard disks.



A few programs let you include or exclude files based on either or both of two hidden attributes called Type and Creator, which specify the type of file and which application created a document, respectively.

Append or Overwrite Tape

Some applications give you a choice of starting a backup at the beginning of a tape, overwriting anything previously recorded, and appending to the end of the tape. Others always overwrite, or always append. The advantage to appending is that you can back up several small volumes on a single tape; however, it takes more time to restore from a backup that starts in the middle of the tape. It may take several minutes to walk through the tape looking for the backup you want to restore. (Keep in mind that a program without an overwrite option can fake it by erasing the tape before starting, then appending the next backup at the beginning.)

Disk Drive and Network Compatibility

All the features in the world do you no good if the software won't work with your disk. As you'd expect, all the tape drives work with SCSI disks, an Apple Hard Disk 20 attached to the disk port, and disks attached to a serial port. Support for MFS volumes is less universal. While not too many people are likely to buy tape drives to back up their single-sided floppies, some do have MFS partitions on their hard disks.

Network compatibility varies. Almost all programs can do an image backup and restore of an *AppleShare* file server, provided the network is shut

Left to right: Mirror's *Magnum Tape 40*, Kamerman Labs' *Cirrus 40T*, and NuData's *Data File all* will be compatible with Apple's *Tape Backup 4OSC* (bottom center).

Tape Drives Compared

Company	ADON	Apple	General Computer	Mirror Technologies
Product name	TD-40	Tape Backup 40SC	HyperTape	Magnum Tape 40
List price	\$1495	\$1499	\$1399	\$1395
SCSI ports (number and type)	two 50-pin	two 50-pin	two 50-pin	one 50-pin
SCSI ID change method	internal switches	back panel switch	back panel switch	internal jumper
SCSI termination method	internal (removable)	external (not included)	external (included)	internal
Size (w × h × d in inches)	9.5 × 3.5 × 12.1	9.7 × 3.07 × 10.5	3.9 × 8.3 × 13.3	3.25 × 7 × 13
Weight (in lbs)	7.5	7.3	7	9
Power requirements	110/220 volts 50/60 Hz (internal jumper select)	85 to 270 volts 47 to 64 Hz	90 to 130 volts 60 Hz, or 180 to 260 volts 50 Hz (2 models)	110/220 volts 50/60 Hz (internal jumper select)
Fan noise	moderate	moderate	moderate	moderate
SCSI cable supplied	none	none	none	SCSI-to-SCSI
Warranty	180 days	90 days	1 year	1 year
Tape	DC 2000 cartridge (QIC-100 format)	DC 2000 cartridge (QIC-100 format)	DC 2000 cartridge (QIC-100 format)	DC 2000 cartridge (QIC-100 format)
Formatted tape capacity	38.5MB	38.5MB	38.5MB	38.5MB
Maximum backup capacity (multiple tapes)	no limit	no limit	no limit	no limit
Mountable volume (icon on desktop)	yes	no	no	no
Reads tapes written by other drives	NuData, SuperMac; will be Apple-compatible	must conform to Apple format	will be Apple-compatible	will be Apple-compatible
Starts Mac with tape power off (Mac Plus with latest ROM)	yes	yes	yes	yes

down first. Because of *AppleShare's* parallel directory structure (PDS), however, only a few programs, such as the one from Peripheral Land or SuperMac's Network DiskFit, can back up the server using a file-by-file method. Restoring an *AppleShare* file server from a standard file-by-file backup destroys the PDS and the associated file-ownership and access-privilege information.

A few applications, including Diversified I/O's SoftBackup, let you back up and restore over an *AppleShare*, TOPS, *MacServer*, or other network. You can hang a tape drive on your local Mac and back up files and folders for which you have read/write privileges on a remote file or disk server. However, in doing so you may bring the network to its knees and lose points in the network users' popularity contest.

Restoring Start-up Disks

A start-up disk must contain special information called boot blocks. These blocks are written in the first sector of the disk when you copy a System file onto the disk using the Finder. An image restore automatically includes the boot blocks. Most but not all the file-by-file restore applications also write the boot block information. Without it, you won't be able to use

the disk to start the Mac. However, you can write boot blocks on a disk that's missing them by dragging the System file from that disk to another disk, and then back again.

Reliability

The right software features may help you make the right backup, but they won't make the backup reliable. Reliability depends on hardware. For example, almost all tape drives have a fan to control temperature fluctuations inside the cabinet (as the temperature rises and falls, tape stretches and shrinks, making it less reliable). If fan noise bothers you, pick a tape drive that can be switched off and still permit the Mac to start up.

Drives that use the Teac mechanism format tapes on the fly during the backup process. Formatting a DC 2000 cartridge is a separate operation that takes about 35 minutes.

The DC 2000 cartridges have a 50 percent data-redundancy factor. This means that if an area of the tape goes bad, the drive can probably recover the data from a redundant copy elsewhere on the tape. The data redundancy exists partly out of necessity. The 3M mechanism records 24 tracks on the $\frac{1}{4}$ -inch tape in the DC 2000 cartridge, compared to 9 tracks on $\frac{1}{8}$ -inch tape in a Teac cassette.

NuData	Peak	Peripheral Land	Relax	SuperMac	Kamerman Labs*
Data File \$1295	Plus 60-Tape \$1295	MacBack Plus 40 \$1295	Tape 60 Plus \$1595	DataStream \$1299	Cirrus 40T \$1499
two 50-pin back panel switch	two 50-pin back panel switch	two 50-pin internal jumper	two 25-pin back panel switches	one 50-pin internal jumper	two 25-pin internal switches
internal (removable) or external (not included)	internal (removable)	internal (removable)	internal (removable)	internal	internal (removable)
6.3 x 2.8 x 8.3	9.7 x 3.5 x 11.25	9.7 x 3.2 x 10	10.2 x 2.6 x 12.8	6.5 x 3 x 10.75	3 x 6 x 9
4.5	9	6	9	4.9	4.1
110/220 volts 50/60 Hz (internal jumper select)	110/220 volts 50/60 Hz	110/220 volts 50/60 Hz (internal jumper select)	110/220 volts 50/60 Hz (internal jumper select)	110/220 volts 50/60 Hz (internal jumper select)	110/220 volts 50/60 Hz (internal jumper select)
moderate	moderate	quiet	no fan	moderate	(not evaluated)
Mac-to-SCSI or SCSI-to-SCSI	SCSI-to-SCSI; Mac-to-SCSI available	none	25-pin to 25-pin	SCSI-to-SCSI	25-pin to 25-pin
1 year limited	1 year	1 year	120 days	1 year	1 year
DC 2000 cartridge (QIC-100 format)	CT-600	CT-500	CT-500	DC 2000 cartridge (QIC-100 format)	DC 2000 cartridge (QIC-100 format)
38.5MB	60MB	44MB	60.11MB	38.5MB	38.5MB
no limit	no limit	no limit with image; 1-tape limit with file-by-file	no limit	no limit	1 tape; no limit next version
yes	no	no	no	yes; caches tape directory on disk	yes (can be partitioned)
ADON, SuperMac; will be Apple-compatible	Relax Tape-60 Plus	no	peak	ADON, NuData, will be Apple-compatible	will be Apple-compatible
yes	no	no	no	yes	yes

*Cirrus 40T received too late to review. Information included in table for comparison.

Speed and Capacity

All else being equal, the sooner you finish the onerous chore of backing up your disk, the better. Drives that use the DC 2000 create an image backup at 800K to 1MB per minute. Drives that use the Teac cassettes can back up an image about twice as fast.

Tape drive capacity is not a major issue for backups, because most software automatically asks for additional tapes as needed. Nevertheless, it makes sense to get a tape drive with at least the capacity of your largest disk drive, if possible. Drives that use the 3M mechanism get an awkward 38.5MB out of a DC 2000 cartridge. That fits a 40MB disk like pants on a growing child. But 3M will soon have competition that gets 43MB out of the same DC 2000, according to one tape drive manufacturer.

Installation

Installing a tape drive is fairly easy. You have to be careful to get the right cable, since there are two types of SCSI connectors in use on SCSI devices for the Mac. The Mac itself has a 25-pin SCSI port, and so do a few disk and tape drives (the Relax tape drive, for example). Most drives, though, have 50-pin ports. So for the first device you usually need a Mac-to-SCSI cable, which has a 25-pin connector on one end and a 50-pin



Both Adon's TD-40 (left) and SuperMac's DataStream (top right), like Apple's drive, use the DC 2000 cartridge. Relax's Tape 60 Plus uses a digital cassette.

Backup Software

Manufacturer	ADON (image)	ADON (file-by-file)	Apple	General Computer	Mirror (image)	Mirror (file-by-file)
Backup/Restore Methods						
Image	•		•	•	•	
Selected file/folder	restore only (use Finder)	•	•	•		•
Automatically backs up files changed since last backup		•	•	•		•
Automatically restores most recent backup of each file		optional				
Timed		4		•		2
Script		•		•		2
Other criteria		type of file		type of file; date; time		
Disk Drive Compatibility						
SCSI disk	•	•	•	•	•	•
Apple Hard Disk 20 (disk port)	•	•	•	•	•	•
Serial-port disk	•	•	•	•	•	•
800K floppy		•	•	•	•	•
400K floppy (MFS)		•		•		•
AppleShare file server	image only		image only	image only	image only	
Owned folders from any AppleShare node (FIB only)		•		•		•
Remote file/folder/volume over other network	all	all		Hypernet, TOPS, MacServe, Keeper	MacServe, ⁶	MacServe, ⁶
Other				password validation		
Max. number of volumes available for backup/restore	six	six, ⁷	no limit	no limit	no limit	no limit
User Interface						
Progress monitoring	•	•	•		•	•
Can cancel during backup or restore	•	•	requires confirmation	•	•	•
Advises what tape contains before beginning	uses Finder	•	•	•	4	•
Advises you to label tape after backup		•		•	4	4
Generates hierarchical directory listing		•		directory of file-by-file tape		disk directory in text or Acta format
Logs files backed up/restored		•		file-by-file		
Logs files not backed up/restored		•		•		•
Logs errors		•		optional		
General Features						
Appends or overwrites tape	overwrites	appends	optional append; image overwrite	overwrites	always overwrites	optional
Can restore to another volume	uses Finder	all or part	file-by-file and image	•	•	adds to existing files
Software developed by	Carl Nelson and Dennis Krueger	Carl Nelson Associates	Apple	D-K Research	Mirror	Mirror

NuData (image)	NuData (file-by-file)	Peak	Peripheral Land	Relax	SuperMac	Kamerman Labs
• restore only (use Finder)	• optional	• • • 4	image only file, folder, or volume separate application 2	• • • •	restore only (use Finder) two versions	restore from Finder; 1 2 3
none	type of file; date	type of file; date; time	date	type of file; date; time	type of file	type of file; file/ folder name; date
• • • • image only	• • • • image only	• • • • image or file-by-file	• • • • image only	• • • • Network requires DiskFit software	• • • • from Finder; 5	• • • • image only
all	all	TOPS, MacServe, Keeper	TOPS, Corvus, OmniNet	TOPS, MacServe, Keeper	none	MacServe; 6
six	six; 7	no limit	eight with image; no limit with file-by-file	no limit	no limit	password protection no limit
• • uses Finder	• • • • • • • overwrites	(eject tape) directory of file-by-file tape file-by-file optional	file-by-file only • • directory of file-by-file tape file-by-file optional	(eject tape) • • • overwrites	• • • • optional	• • • • append
uses Finder	all or part	•	•	•	•	•
Carl Nelson and Dennis Krueger	Carl Nelson Associates	D-K Research	Peripheral Land	D-K Research	SuperMac	Kamerman Labs

¹File-by-file next version.

²Next version.

³Optional next version.

⁴Future version.

⁵File-by-file and image next version.

⁶TOPS next version.

⁷No limit next version.

Two Tapes in Review

Compared to disk drives, tape drives for the Macintosh have been a long time coming. At this writing, it was too early to review the file-by-file backup and restore capabilities of most tape drives. However, file-by-file software for the Mirror Technologies Magnum Tape 40 and the Peripheral Land MacBack 40 had been shipping for several months. This review evaluates those two tape drives.

The Hard Part

The Mirror and Peripheral Land tape drives are quite different physically. The Mirror drive is tall and thin, so it takes up little desk space. It has only one SCSI port and must therefore be the last device in the SCSI chain. It uses DC 2000 tape cartridges that store up to 38.5 megabytes each, the same as Apple's tape drive. Mirror intends to make its Magnum Tape 40 compatible with Apple's tape drive as soon as Apple publishes the necessary information.

The Peripheral Land drive fits under a Mac Plus or SE, taking up no additional desk space. But if you don't want to raise the screen 3 inches, the drive claims quite a bit of real

estate. Peripheral Land uses fast Teac digital cassettes that store up to 44MB each. The tapes are interchangeable only among MacBack Plus 40 drives.

The two tape drives do have some physical similarities. Both have adjustable SCSI ID numbers and terminators inside their cabinets. A technician can set the ID to eliminate conflicts with other SCSI devices. Peripheral Land's terminators also must be removed if you hook up the drive between two other SCSI devices.

The manufacturers claim their tape drives will back up almost any volume that appears on the desktop (see the table "Backup Software" for more details). I had no trouble using either tape drive with a DataFrame 20XP, an ADON 30, an Apple Hard Disk 20 connected to the disk port, or 800K floppy disks. The Peripheral Land drive backs up and restores remote volumes over a TOPS network; the Mirror drive does not work with TOPS, but Mirror expects to fix that this summer.

Being Selective

Peripheral Land's MacBack Plus

comes with three applications, two for backup and one for restore. One backup application makes an image backup. Once you set the time and select a volume, you cannot cancel gracefully—you must reset the Mac.

The main Peripheral Land backup application lets you make an image backup or back up one file, one folder, or one volume. Because you can only back up one file or folder at a time, backing up several files or folders can get tedious. Perhaps the script feature Peripheral Land plans to add will address this shortcoming.

The third Peripheral Land application restores backups made by either backup application. It can restore an image, file, folder, or volume backup, and can also restore single files or folders from a volume backup. However, it cannot restore a batch of files or folders at once.

Mirror furnishes two applications with the Magnum Tape 40. One, intended primarily for backing up an entire *AppleShare* file server, performs an image backup or restore. The other backs up and

connector on the other. For the second device, you usually need a SCSI-to-SCSI cable, which has 50-pin connectors on both ends.

Most drives have two ports, but a few have just one. The single-port device must always be the last in the chain. Be careful not to get more than one caboose, or you won't be able to chain all your SCSI devices together.

Each SCSI device must have a unique ID number between 0 and 6. The Mac also has an ID number, 7. It doesn't matter which device has what number, but each must have a different one or the Mac won't be able to start up. Many tape drives have a switch on the front or back panel for setting the ID number. A few

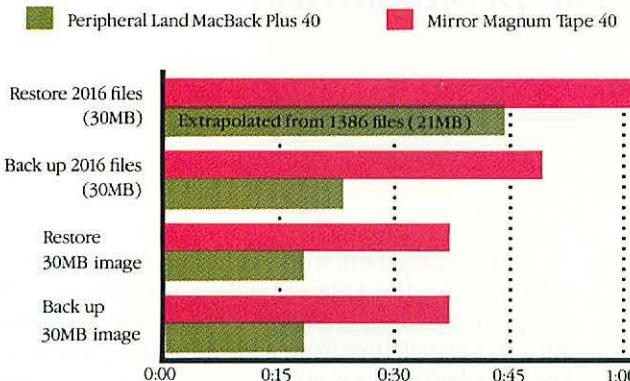
drives must be opened to gain access to jumpers or switches inside the cabinet.

Also, if you attach more than two SCSI devices to the Mac, only the two end devices should have terminators. Some drives have removable terminators inside their cabinets. Others use an external terminator between the SCSI port and cable.

Tape Interchangeability

If you plan to use tapes to acquire or distribute programs or data, it's best to get a drive that uses DC 2000 cartridges. Because Apple uses them in its drive, they will become the de facto standard. All manufacturers contacted who use the DC 2000 cartridge intend to have some sort of compatibility, even if it's just a util-

Tape Backup/Restore Performance (Using standard Mac Plus)



restores file by file. It's easy to use because you select any combination of files and folders in a dialog box much like the standard Open dialog.

Performance

The Mirror drive takes twice as long to complete a 30MB image backup or restore as the Peripheral Land drive does (see "Tape Backup/Restore Performance"). The Peripheral Land drive would probably also do file-by-file backup and restore about twice as fast as the Mirror drive. However, direct com-

parison of file-by-file times for the same test disk was impossible, since I couldn't get the MacBack Plus 40 to successfully back up and restore 30MB and 2016 files. According to Peripheral Land, the current version of the backup software can back up no more than 1500 files; however, this limit will be raised in the next version.

A file-by-file restore from a Mirror drive includes writing the start-up information, or boot blocks, so the restored disk can be used to start the Mac (see "Safety Net for Storage" for details). The Periph-

eral Land drive does not write the boot blocks.

Error handling

Neither Mirror nor Peripheral Land applications were very forgiving. They responded with vague or cryptic messages to errors such as using a write-protected tape during backup or a full-destination disk during restore. I encountered several fatal errors during backup and restore with both drives. Both companies said they are improving error handling.

Recommendations

Both the Mirror Magnum Tape 40 and the Peripheral Land MacBack Plus 40 are well-made machines. You'll have to decide whether you prefer the speed of the Teac tape in the Peripheral Land drive or the interchangeability of the 3M tape in the Mirror unit.

The Peripheral Land software does a good job of making fast image backups, but it needs improvement before I can recommend it for making file, folder, or volume backups. The Mirror software is fine for both image and file-by-file backups.

ity program that reads and writes the Apple format.

However, if you need to distribute information to a controlled population, such as several branches of a large corporation, you can use any of the drives. You should either stick to one model or at least choose drives that use the same type of tape and software. For example, Peak and Relax drives are compatible, as are ADON and NuData.

You may be able to read your tape on another drive that uses the same type of media by using your drive's software with the other drive. For example, you can read ADON or NuData tapes on Mirror or Super-Mac drives by using ADON or NuData software.

Backup Decisions

Is there a tape drive in your future? If you need removable mass storage for any reason—hard disk backup, increased storage capacity, or distribution of large amounts of software or data—the answer is yes.

If your main concern is speed, pick one of the units that uses the Teac mechanism. If you must read and write tapes in the Apple format, get a drive that uses the DC 2000 cartridges. Take a close look at the backup software and make sure it has the backup methods, disk and network compatibility, and other features you need. □

See *Where to Buy* for product details.

Top of the Charts

On stage and in the studio, the Mac is number one with music professionals

by Christopher Yavelow

Five years ago you would have been hard pressed to find a full-time MIDI consultant, sound designer, or programmer working for a professional musician. Today people with such job descriptions abound.

Personal computers are revolutionizing the music business, and the Macintosh is leading the way. Nearly four dozen companies are developing musical products for the Mac, compared to scarcely a dozen for all other PCs. Macintoshes can be found in recording studios, on performance stages, in orchestra pits, and in the classrooms of some of our most renowned institutions of musical learning.

In December, *Macworld* looked at music processing programs that enable composers to print standard notation from MIDI performances (see "From Keyboard to Score"). But music professionals are putting the Mac to work in a variety of areas besides composition and publishing. Particularly in sound design, performance situations, and film scoring, the Macintosh is finding a place as a key piece of equipment.

Sound Design

Sound design is a field that encompasses a wide variety of activities, ranging from going out and recording natural sounds to programming synthesizers or setting up complex performance configurations. The new sounds created by this work often provide the essential ingredient that communicates the subliminal impact of a movie scene, or they may comprise the unforgettable characteristics of a corporate sound *logo* (an identifiable musical theme, usually under six seconds in length and over five figures in price). Finally, whereas in the past a pop group's unique sound might have been attributed to its recording engineer, today it's often traceable to the raw material provided by the sound designer.

Sound designers work with sounds that are initially produced by either sampling or synthesis. *Sampling* is a digital recording procedure, similar to creating a moving picture from a series of still photographs. The sampler takes a number of "snapshots" (samples) of the sound and plays these back at a very high speed—usually between 32,000 and 50,000 samples per second. Because the samples are all in numeric form, it is easy to manipulate and transform the sounds they represent (*digital effects processing*). On the other hand, sampled *soundfiles* require vast amounts of memory.

Besides using sampled sounds, sound designers also create sounds from scratch by using either hardware controls or a computer to set parameters for the built-in sound-generating capabilities of a synthesizer. A synthesizer configuration that can be recalled for future playback is called a *patch*. Since patches don't record any sound data but merely the parameter settings needed to re-create a specific sound, they don't require much memory.

Serafine FX

Frank Serafine is a sound designer and composer whose sounds and effects have been heard in such blockbusters as *Star Trek (I & III)*, *Poltergeist 2*, and *Tron*. His studio, Serafine FX, employs engineer Rick Schwartz; librarian Peter Smetad; dozens of devices for generating, modifying, and recording sound; and three Macintoshes.

Serafine mixes sounds the way visual artists mix paints, sometimes combining hundreds of sounds to make a single effect. To create explosion sounds, for example, he once went into the desert with some marines to blow up 500-pound bombs. He captured the explosions with a digital recorder and then sampled them into his Emulator II. The effect was good, but not good enough. Using Digidesign's *Sound Designer*, Serafine supplied the missing ingredient: "We added a lion's roar to the bombs and flanged them beyond belief. The effect was much better [with *Sound De-*



MARK HANAUER

Film composer and sound designer Alan Howarth uses a variety of programs to seek out new sounds and boldly go where no Mac has gone before.

signer] than would have been possible with an out-board effects processor." *Flanging* is the process of "thickening" a sound by combining it with delayed versions of itself.

In addition to sounds he records himself, Serafine garners sounds from a wide range of sources, including sound effects libraries on compact disks, CD ROM libraries for the Emulator II Sampler, or other floppy disk-based sample libraries. He even used First Byte's *SmoothTalker* to do initial sketches for the robot in *Short Circuit*, although the final robot voices were made with *DECtalk*. Because he must be able to locate specific sounds instantly, Serafine uses *Microsoft File* to keep track of his ever growing collection.

Mr. Warp Drive

Alan Howarth is another Hollywood Mac music professional. Lately he has been working as a composer with John Carpenter on such films as *Escape from New York*, *Halloween 2* and *3*, and *Big Trouble in Little China*, but he got his start in sound design. *Star Trek* was his first major picture (as it was Frank Serafine's). After creating sound for *Raiders of the Lost Ark* and *Poltergeist*, Howarth went on to do the effects for the next three *Star Trek* sequels. If you can



The tapeless studio at Serafine FX includes three Macs and an 85-megabyte hard disk. Macs are used for everything from sequencing to console automation and signal manipulation.

recall the sounds of the "transporter" (usually preceded by the command "Beam me up, Scotty"), the warp drive, or the Klingon "Bird of Prey" spaceship, you know Howarth's work.

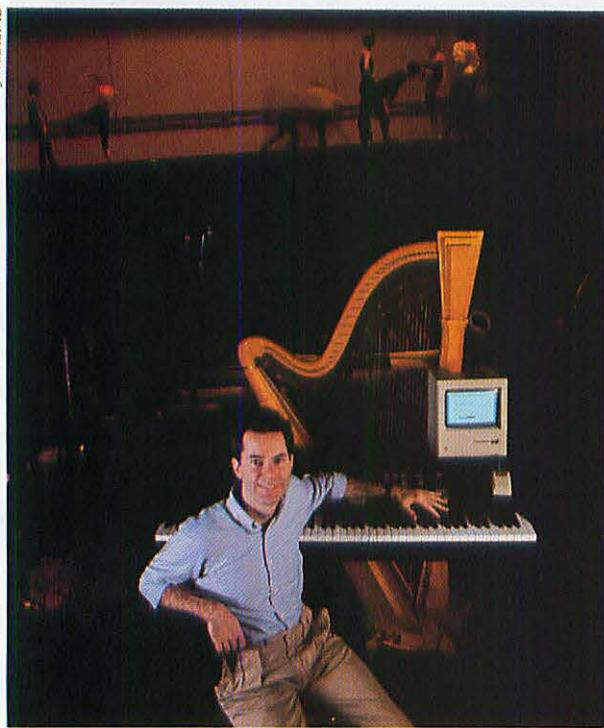
Howarth uses Digidesign's *Sound Designer* and *Soft Synth* packages with an Emulator II. "I use *Sound Designer* as an editorial tool because of its ability to cut, paste, double up, and pull out or extend the middle of a sound in ways that wouldn't be possible within the sampler itself," he explains. "When you have nice sounds, you don't want to loop them [a commonplace technique that extends a sound to a prescribed duration by repeating a portion of it], you want to do variations."

"Cutting sounds in analog form [using magnetic tape] makes your editorial base as wide as the razor blade. Using *Sound Designer* with a sound sampled even at a low 28K sampling rate gives you 28,000 possible edit points."

Howarth's work on *Star Trek IV* was interesting because the sound effects—mysterious, destructive transmissions from an alien probe that ultimately turn out to be whale songs—are a key part of the story. Usually sound effects are added during postproduction. In this case, however, the actors had to be able to react to the sounds during filming. Howarth recalls director Leonard Nimoy asking merely for "gibberish, something I've never heard before."

To create the working version of the whale effects, Howarth started with real whale sounds and processed them, running them backward and forward, fast and slow, piling layer upon layer until he had filled all 24 tracks of his tape recorder. The result was used throughout the shoot. During postproduction, however, the complex sounds were scrapped in favor of a single whale song, processed through a harmonizer

JOYCE RAVID



Richard Morehouse of the New York City Ballet uses the Mac to bring more fidelity and flexibility to the company's orchestral accompaniment. For its annual Nutcracker performances, for example, the NYCB orchestra used to follow a recording of a boys choir for certain dances. Today Morehouse uses a sample file he fine-tuned in Sound Designer and stores in the Mac to "play" the choir on his Kurzweil.

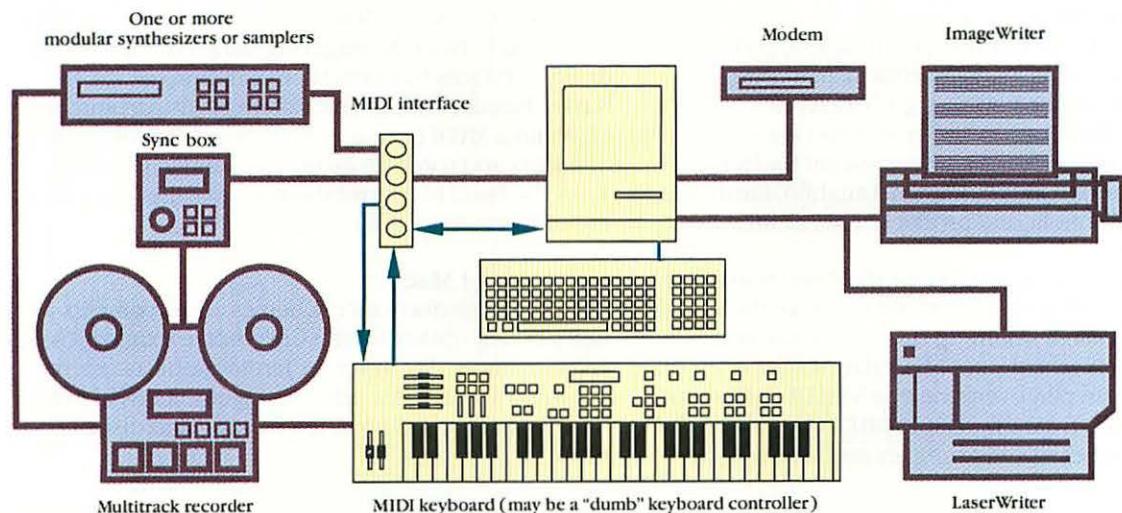
Basic Studio Setup

Two essential hardware peripherals form the nucleus of any Mac music setup. The first is a MIDI-compatible sound-generating device (either a synthesizer or a sampler). Instead of a keyboard with built-in sound capabilities, many people opt to use a "dumb" MIDI controller keyboard in conjunction with modular sound-generating devices. The second re-

quirement is a MIDI interface that permits the Macintosh to communicate with the soundware.

Depending on the application, a printer, a multitrack tape recorder, digital signal processors (such as a reverb), a MIDI "through box," or a SMPTE (Society of Motion Picture and Television Engineers) Time Code synchronization device may be included in the link.

Once the basic requirements are met, systems are expanded by the addition of more synthesizer or sampling modules, signal processors, or memory. Everything else can be done in software: MIDI sequencing, sound-sample editing, patch editing, conventional music notation, and even many types of sound synthesis.



using feedback and recorded onto a monophonic track. In the end the elaborate working version was important only in helping the director find out what he didn't want. Howarth, who is sometimes known as Mr. Warp Drive, sees this as just one of many routes a designer must sometimes travel to zero in on the right sound, since directors are often unsure of what they want or are unable to describe it.

Because he's both a composer and a sound designer, Howarth is keenly aware of the drawbacks of pioneering a relatively new field. Sound designers, for example, aren't eligible for the royalties composers enjoy. "There's no union category for sound designers," Howarth laments, "but I may get some royalties from sounds that are included in CD ROM libraries." Howarth adds that when he has a sound creation he especially wants to protect, "I just call it music and file a tape of it with a Sound Recording form at the copyright office."

Performance

In performance applications the Macintosh is used primarily as either a sound storage device or a sequencer. When it acts as a sequencer, the Mac reads MIDI data stored on disk as a sequence and uses it to play MIDI instruments. This type of application is often used when—for financial or other reasons—there aren't enough musicians to play all the parts.

Using the Mac for storage is far more common. Since the RAM in most synthesizers and samplers is not sufficient to hold the large number of patches, soundfiles, MIDI configurations, and other sound information necessary for a lengthy performance, this data is loaded into the Macintosh. At the right time, an assistant keys the Mac, which loads the data into the appropriate devices.



The elaborate MIDI configuration used by Neil Young and company on their "Crazyhorse '87" European tour enables the band to more easily reproduce the sound of its latest album.

Crazyhorse '87

Bryan Bell recently used both types of Macintosh applications in an elaborate performance configuration he designed for Neil Young's "Crazyhorse '87" European tour. Bell has worked at various times as a programmer, engineer, mixer, or consultant for Herbie Hancock, Carlos Santana, John McLaughlin, Earth Wind and Fire, Al DiMeola, and producer Narada Michael Walden.

Bell was originally hired for the Crazyhorse tour to design a MIDI setup that would re-create the sound of the band's latest album. To this end he created a patching system that routes MIDI data so that everyone in the band can play everyone else's MIDI equipment. Signals coming from the various MIDI controllers are routed to synthesizer and sampler modules by four

MIDI patchers. Not all the MIDI controllers are synthesizers—one is an upright piano that has been modified to send MIDI, and some of the guitars are equipped with pitch trackers. (Pitch trackers convert audio signals from acoustic instruments into MIDI data. To do this, the software must determine a note's frequency and then send out the appropriate MIDI code, all on the fly, in real time.)

Along with designing the MIDI network, Bell became involved in designing sounds and patches for Young. For the analog and digital synthesizers, Bell used various patch editors and librarians from Opcode Systems. Because Bell's setup uses so many different synthesizers, Dave Oppenheim (the "Op" in Opcode Systems) created a special patch librarian that puts all the patches in a single library file.

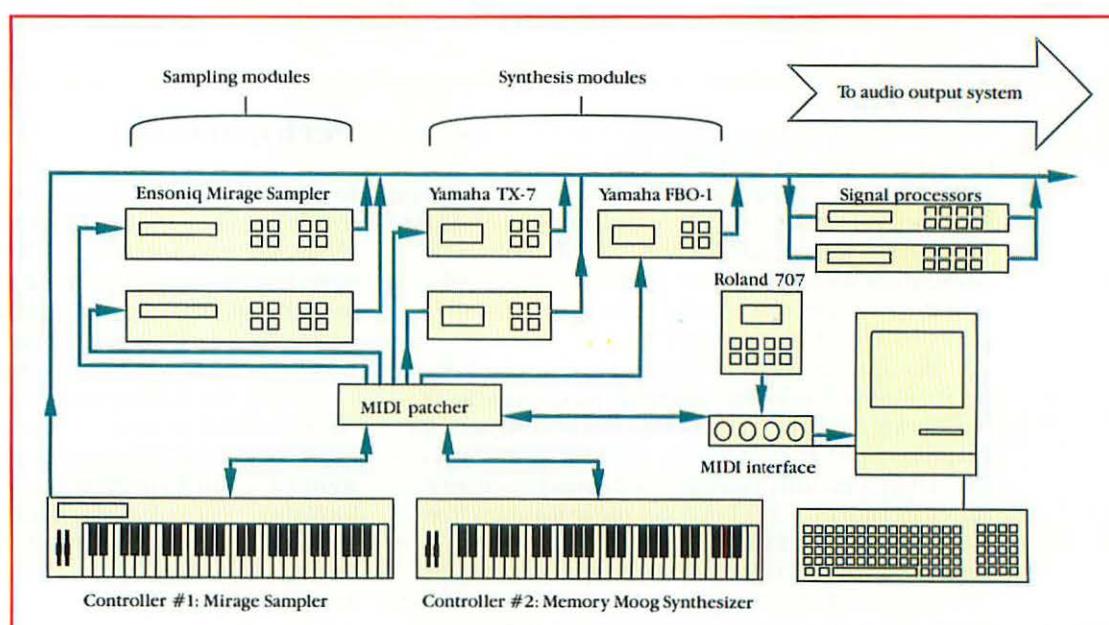
Many of the samples used in Bell's system were made directly from the album's master tapes. When you're faced with the need to re-create the sound of a specific record, it's a great advantage for the drummer to be able to trigger identical sounds by striking MIDI drum pads. (Besides triggering sampled sounds, the drum interfaces to a new type of timing device, the Kayler Human Clock, which converts the drummer's beat into a MIDI timing pulse that synchronizes the sequencers and patch changes. The Human Clock enables the band to control the tempo of the sequencers rather than vice versa.)

Cabaret Mac

Not all performance schemes are as complex as Bell's configuration for the Crazyhorse tour, which takes an entire day to set up. Jeremy Roberts recently designed a system for cabaret singer Eileen Valentino that can be hooked up in ten minutes and dismantled in six.

Figure 1

Jeremy Roberts's performance configuration expands the elementary system (see "Basic Studio Setup") by adding extra synthesis and sampling modules to two keyboard controllers that themselves are sound-generating devices. The centrally located MIDI patcher directs the controller output to the appropriate modules.



Valentino usually travels with an orchestra of 18 musicians, but the stage on which she was performing at the Trump Castle Casino, in Atlantic City, had room for only three. Roberts's solution is a slightly expanded version of the arrangement in "Basic Studio Setup": he uses a Macintosh-controlled rack of nine (mainly modular) synthesizers to accompany the human drummer, bass player, and guitarist (see Figure 1). This setup, which took two months to prepare, puts the Macintosh on stage with the band, and puts Mark of the Unicorn's *Performer* MIDI sequencer in control of several samplers and synthesizers.

Because the order of the songs in each 45-minute show changes from time to time, Roberts has had to devise some innovative strategies for loading the appropriate files into the samplers and the correct sequence files into the Macintosh.

He uses *Automac* to create macros that open and close sequence files. For the first song of the night, he runs a macro that sets up a RAM cache, begins a start-up application, and loads files into the cache.

The *Automac* macros that load the various sequences search for files by number. This means that changing the order of the set merely requires changing the leading number in the sequence file name. The macros are set up to close the current sequence and open the next one. "Say we have just finished our third song," explains Roberts. "Assuming the last patch is loaded, I will already have popped the disks out of the samplers—the disks are all color-coded, and each sampler has its own color. I load each of the boxes with my left hand while I hit Option-4 with my right hand. This closes the third sequence and opens the fourth sequence. Hitting Enter on the numeric keypad starts the next song even before the Mac has had time to finish drawing the screen. On a hopping Saturday night, the singer might get ahead of the click track, so I use the asterisk key to advance *Performer*'s tempo in single increments."

The Macintosh is used for other tasks as well. All Valentino's musicians read music printed with Mark of the Unicorn's *Professional Composer*. The Image-Writer stays in the dressing room, and every night when the order of the show has been decided, 36-point set lists are printed in *Microsoft Word*. This task is simplified by *Word*'s glossary, which stores all the necessary information. Most nights, Roberts takes the Mac back to his room to log on to the Performing Artists' Network (PAN) or the MacMusic BBS.

Film Scoring

The film and video industries use a timing protocol known as SMPTE (Society of Motion Picture and Television Engineers, or "Semp-tee") Time Code to synchronize film, video, or other devices. The protocol's effective resolution is about half a millisecond, enabling engineers to move to locations on SMPTE-striped audio or video tapes with great precision.

Unfortunately, SMPTE is not directly compatible with MIDI, the language of the music world. To get

Studio of the Future

With considerable foresight regarding the impact of microcomputers on the music industry, the Record Plant recently opened Stage L on the Paramount Pictures lot in Hollywood. Stage L includes four studios, each with a Macintosh that can control just about any sound-generating or processing device one could desire. The rooms are equipped with state-of-the-art SSL computer-automated mixing boards and multitrack digital recorders.

The idea is similar to that behind desktop publishing centers, where Mac users with previously prepared documents rent time on expensive Laser-Writers. Both Chris Stone, owner of the Record Plant, and Ed Freeman, MIDI and software consultant for Stage L, are strongly committed to the new generation of composers who will arrive with disk in hand, having done most of their work on the Macintosh in small home studios.

around this problem, many film composers now use the Macintosh in combination with a synchronization box to synchronize MIDI devices, such as synthesizers, with SMPTE information. Configurations like the one in Figure 2 enable composers to precisely correlate synthesized or recorded music events with selected on-screen events (*hit points*).

The Mac also enables composers, who can rarely afford their own SMPTE equipment, to save on studio time by working out their preliminary scoring at home. New Mac programs such as *Cue*, from Opcode Systems, take SMPTE information about the location of hit points and translate it into standard musical timing terms, such as beats per minute. The programs then print out staff paper that shows the number of beats and measures between hit points; the composer uses this custom staff paper as a scoring framework.

Opera in the Eighties

When the author, Christopher Yavelow, is not MIDI consulting, writing about computer-assisted composition, or downloading the *Professional Composer* files his students send to his electronic-mail box, he composes opera. This spring when he used his Macintosh and Kurzweil 250 to create and perform the first act of the opera *Countdown*, it may have been opera's closest encounter yet with the world of computer technology.

Countdown, which is set in an underground NORAD missile command center, was commissioned by the Boston Lyric Opera Company as part of an intensive 12-day composer-librettist collaboration project

sponsored by Opera in the Eighties and Beyond, under the auspices of Opera America and The National Endowment for the Arts.

Every day Yavelow received new text from the librettist (award-winning screenwriter/playwright Laura Harrington) and went home to compose new music at a Macintosh, cutting and pasting operatic leitmotifs with *Performer*. The sequencer controlled a Kurzweil 250 configured to be a "symphony orchestra in a box." The orchestral score was automatically reduced to piano transcriptions for rehearsal using *Professional Composer*, and these were printed each night while everyone was asleep. The singers received new music for rehearsal every day, along with a tape of the orchestra parts produced by the Kurzweil.

The piece was finally performed by the Boston Lyric Opera Company accompanied by a Macintosh, which controlled the full symphony orchestra score output in real time through a Kurzweil. A Roland SBX-80 sync box was used to keep everything together, even through changing tempos, accelerandos, and rallentandos.

"Everyone was astounded," says Yavelow, referring to the productivity made possible by the Mac. "Usually, when Opera in the Eighties funds these intensive projects, it ends up with an aria or a short scene. Without the Mac, a whole act would usually take six months to a year to prepare."

—Joe Matazzoni

Omnimax

Pat Hollenbeck recently worked with Oscar-winning film composer John Williams on the music for *New England Time Capsule*, a film sponsored by Lotus and created for the opening of the Boston Science Museum's new Omnimax theater. "Williams operates at a level where, if he wants real strings, he can afford them—and lots of 'em," laughs Hollenbeck, adding "computers might just slow him down." But Hollenbeck is no stranger to synthesizers and computers, and the Macintosh was a welcome tool for his part of the collaboration (see Figure 2).

The Stephen P. and Marian G. Mugar Omni Theater is the largest of twelve Omnimax theaters in the country. The theater houses a 360-degree dome screen 76 feet in diameter along with a 27,000-watt, 84-speaker, 12-channel sound system. Extra-large film (ten times normal size) is projected at very high speeds through a 180-degree fish-eye lens powered by a 15,000-watt water-cooled xenon arc lamp.

The music for the opening of this high-tech showcase was built up in stages onto 48 tracks (two 24-track recorders were "locked" together using SMPTE time code and made to function as a single machine). Musicians participated in several sessions—one for the

brass, then the winds, then the strings, and finally the harp. They performed while listening to a *click track* through headphones. Everything stayed in sync because the click track remained in a constant relationship to a SMPTE stripe on a videotape copy of the film. When it was necessary to add the synthesizers (12 Yamaha TX816 modules, 2 Emulators, an Ensoniq Mirage, a Korg 800, and a Kurzweil 250), the click track was converted into MIDI Sync via a Roland SBX-80 synchronization box. This MIDI Sync pulse controlled the sequences, which had been recorded on the Macintosh with *Performer*. Subsequently, the sequences controlled all the synthesizers.

The 48-track analog tape was mixed down to 13 tracks, and a mixing console was set up in the theater to do a final live mixdown that would take into account the acoustic properties of the Omni Theater. The soundtrack was never actually recorded onto the Omnimax film; instead, it was recorded onto special 35mm magnetic film, which was in turn electronically synchronized to the Omnimax film. Except for the last step, the Omnimax scenario for getting sound on film is becoming more and more commonplace.

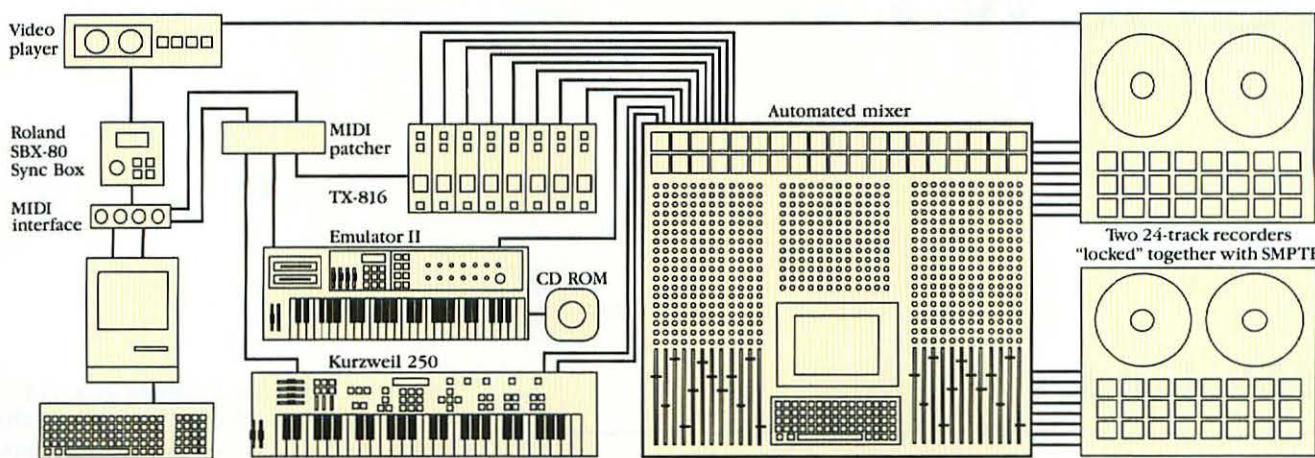


Figure 2

A typical recording studio setup for the Williams/Hollenbeck collaboration. A click track loaded into the SBX-80 converts SMPTE Time Code into MIDI Sync, which permits a Macintosh running *Mark of the Unicorn's Performer* MIDI sequencer to "chase" the video and analog tape. This, in turn, guarantees that sampled and synthesized material transferred to analog tape will be in sync with earlier tracks of musicians who performed while listening to the original click track.

Real Time

Unlike the highly structured mathematical approach to film synchronization necessary for the Omnimax project, the method Patrick Moraz recently used while composing for *The Stepfather* represents a marriage of high-tech with the real-time styles of traditional film composers, who conduct musicians while watching the movies for which their music is created. Moraz is better known as the keyboardist for the Moody Blues and, before that, for Yes. In some ways he is the complete Mac musician, using the computer in a wide variety of performance, composition, and studio applications. A Mac will figure prominently in the setup for his solo "Human Interface" tour this summer.

In *The Stepfather*, Moraz used a Mac in a link reminiscent of the Williams/Hollenbeck hookup described earlier. For the 62 cues punctuating the 48 minutes and 11 seconds of music in the psychodrama, Moraz used both the internal dedicated hardware MIDI sequencer of the Kurzweil 250 and *Performer*. He recorded important hit points into a Roland SBX-80 synchronization box by tapping on one of its front panel pads while viewing the film. This recorded information was subsequently used to synchronize the tempos of the sequences with the action on the film.

Finally, when the film company asked for lead sheets (melody lines with chord symbols) for copyright purposes, all the hardware-resident sequences were loaded back into *Performer* for conversion into notation by *Professional Composer*.

Is It Live . . .

The long-promised wonders of technology are now well-established fixtures, used on a daily basis by professional musicians. The next area in which the pros are taking a serious interest is interactive composition. Tools that allow composers to zoom out and deal with entire musical ideas, rather than individual notes, are beginning to appear. New sequencers such as Passport Design's *MasterTracks* represent musical material in a graphic format that permits composers to work from greater levels of abstraction.

Perhaps the most important recent musical developments capitalize on the Mac's ability to make thousands—sometimes millions—of decisions in the space between two notes. This ability to automate compositional decisions within user-defined limits is beginning to produce commercially available "intelligent instruments." Notable explorations of this territory include Laurie Spiegel's *Music Mouse* (an expert system for composing, published by Opcode Systems) and Intelligent Computer Music Systems' *M* and *Jam Factory*.

These and other tools made possible by the computer revolution are already calling into question common ideas about music and musicians, blurring time-honored distinctions and redefining traditional roles. Not that long ago, Neil Young's plaintive vocals and soulful guitar were as unambiguous as a smoldering draft card. Today Young's concertgoers are hard-pressed to tell real live music from what's produced by the Mac. How audiences and artists will respond as computerization becomes more common, and whether this trend will lead to better—or simply more—music remains to be seen. I have no doubt, however, that we are in the midst of one of the most interesting periods of music history. Keep your ears open. □

Reviews

A Portable Finder

DiskTop 2.0

Desk-accessory Finder alternative. **Pros:** Contains all standard desktop file functions; can perform operations on several files at once; initiates a "quick-launch" to another application. **Cons:** Takes up a good deal of disk space. **List price:** \$39.95 (includes LaserStatus and Widgets). **Requires:** 512KE. **Copy protection:** None.

 How many times have you wanted to perform a housekeeping function—copy or delete a file, move a file to another folder, create a new folder—when you're working in an application? You'd prefer to take care of the chore on the spot, rather than make a trip back to the desktop. Similarly, if you use a standard *Switcher* set all day long and need to open another application, if you must free up space on a disk to save a file, or if you can't find a particular file, you'll find yourself returning to the desktop. Fortunately, CE Software's *DiskTop* offers virtually all of the Finder's functions, and quite a bit more, in a single desk accessory that can be opened from within an application.

Disk Statistics

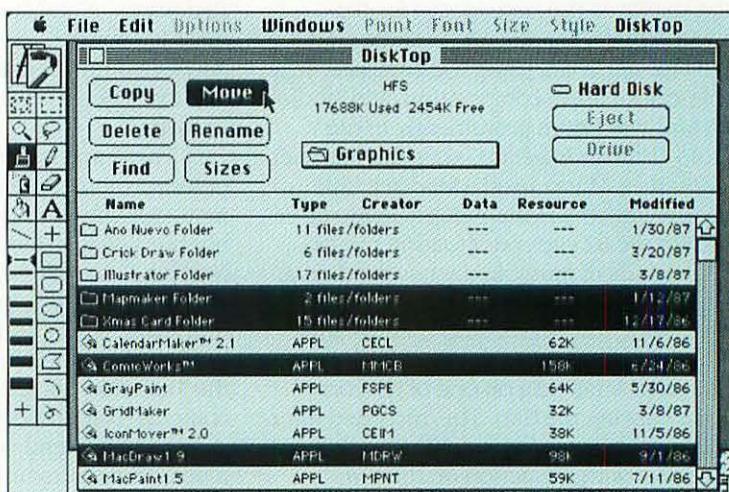
When you first select *DiskTop* from the Apple menu, the window displays up to eight floppy disk or hard disk icons. Alongside each icon are the disk's vital statistics: HFS or MFS, total disk space in use, and free disk space remaining, as well as total RAM in your Mac and amount not currently in use. A Trash Can is used to eject (or unmount) disks, just as it is on the desktop. The window also contains buttons for erasing or renaming entire disks and a Find button to initiate a file search of any or all displayed disks; a dialog box displays the path to each file (the route from disk to folder to file) matching the search criteria.

Double-clicking on a disk icon displays disk information (HFS or MFS, used and free space) and a scrollable list of files, folders, and applications. If you open a folder, the list displays the contents of the folder. Files and folders can be displayed by name, type, creator, file size, or date last modified.

DiskTop displays eight buttons that perform a variety of operations on disks, files, or folders (see "File Management with a DA"). The Drive and Eject buttons function just like their file-selection-box coun-

terparts. Once a file, folder, or group of files or folders is selected, you can use the Delete, Rename, Move, and Copy buttons. The Delete button performs the equivalent of putting a file in the Trash Can and then emptying it (once you confirm your decision). The Rename button requests new folder or file names one at a time. Copy and Move work on all selected files or folders at once, moving or copying them to another folder or disk. The Find button initiates a search for files or folders. To determine if you have enough room to copy a group of files onto a disk, use the Sizes button to compute the amount of disk space taken up by all the selected files and folders.

DiskTop not only lets you manipulate files without quitting an application, it saves you a trip to the desktop when you do quit. If you double-click on an application or document in the files list, *DiskTop* quits the current application (allowing you to save your work first) and opens the se-



File Management with a DA

DiskTop lets you work within any file without leaving an application. You can move, copy, rename, and delete files, make new folders, find lost files, and more. Here, several files and folders are being moved to a new folder on a hard disk.



lected application or document. (In the few programs that resist this time-saving method of bypassing the desktop, you can quit the program manually, and *DiskTop* will immediately take over and launch the selected application.) To make this process even more convenient, you can place up to 20 commonly used applications or documents in the *DiskTop* menu. Then you can just select your destination from the menu.

Bonus Applications

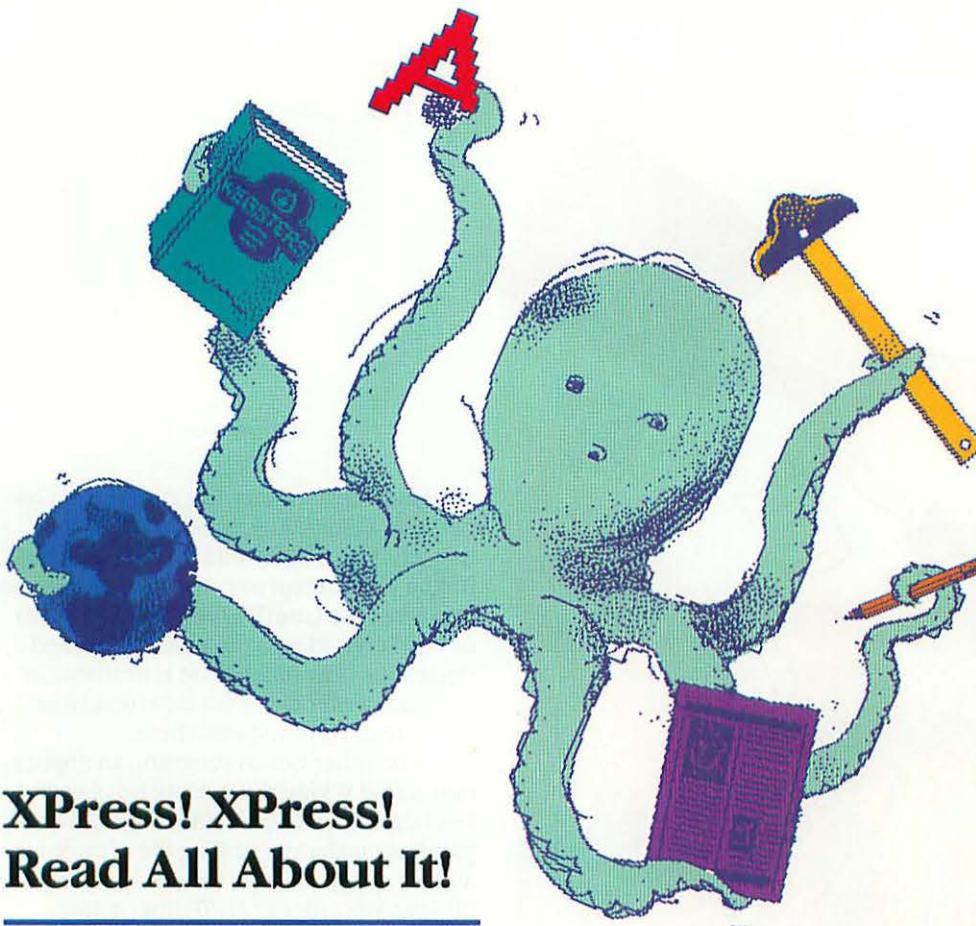
Like all of CE Software's products, *DiskTop* is shareware, which means that you can get a copy (from a friend, a shareware disk library, or a bulletin board) and try it out prior to purchase. If you decide to buy *DiskTop*, you'll receive a disk with the latest version of the program, a comprehensive manual, and two bonus programs

not available to nonpaying customers. One of these, *LaserStatus*, is a desk accessory that tells you if a shared LaserWriter is busy before you attempt to print. *LaserStatus* can also reset the LaserWriter, download fonts or PostScript files to the LaserWriter, and determine how much RAM is available in the LaserWriter and what downloadable fonts are currently stored there.

The other bonus program, an application called *Widgets*, is a pastiche of useful but largely unrelated utilities. *Widgets*' capabilities include changing the creator for all files of a given type (useful for changing all *MacPaint* files to *FullPaint* or *MacBillboard* files, for example); changing the size of the System heap (handy if your System file is stuffed with fonts and desk accessories); renaming and redefining ImageWriter paper sizes; creating bit-map files from PICT files; and turning any part of a *Paint* file into a Start-up screen. You can also use *Widgets* to turn off the mechanism that makes the LaserWriter print a test page each time you turn it on, and to print "Laser Thumbnails," tiny versions of all the *Paint* files in a selected disk or folder.

All in all, the *DiskTop* package is an excellent value. Its only significant drawback is that it requires about 49K of disk space. While you may find some of *Widgets*' different elements more useful than others, you'll probably adopt a Widget or two; for example, I've found Laser Thumbnails to be an excellent way to catalog clip art files. And *LaserStatus* is a great utility for anyone who puts the LaserWriter through its paces. But most important for me, *DiskTop* has replaced desk accessories like *DiskInfo* and *HFS Locator*, which used to be indispensable elements of my Apple menu. There is, in my opinion, no better file-management desk accessory.—*Robert C. Eckhardt*

See *Where to Buy* for product details.



XPress! XPress! Read All About It!

XPress 1.01

Desktop publishing program. Pros: Powerful blend of interactive and batch pagination features; virtual memory system with full-featured word processor, spell-checker, extensive typographic controls, precise layout tools, unlimited text wrap, and spot color assignment. Cons: Lacks global formatting, indexing, vertical justification; can't cut or copy and paste graphics directly from one page to another without added steps; wrapping causes incorrect hyphenation. **List price:** \$695. **Requires:** 512K. **Copy protection:** Limited to three hard-disk installations.

Quark's XPress is a desktop publishing program that integrates word processing, graphic design, and page composition capabilities. It outperforms other second-generation desktop publishing programs by combining the interactive style of *PageMaker* with the batch pagination power of *ReadySetGo* 3.0 and some new tools previously found only in expensive publishing workstations. *XPress* is *versatile* enough to be used for large projects requiring automated batch pagination as well as for smaller, single-page layouts.

Handling Text

XPress's word processor is as flexible as any stand-alone word processor and performs better than those found in other desktop publishing programs. It includes a fast 60,000-word spelling checker, search-and-replace capability, and both automatic and manual hyphenation.

XPress has an impressive array of text design tools—kerning, tracking, scaling, screening, coloring—that can be used in unlimited combination. You can justify text

with any combination of interletter and interword spacing. To kern (adjust interletter spacing), just move the cursor and add or subtract space by $\frac{1}{100}$ -em increments.

With the tracking (global kerning) feature you can adjust interletter spacing within a highlighted word, paragraph, page, or document. Use horizontal Scaling to copyfit text (headlines, for example) by stretching or compressing it horizontally from 25 to 400 percent.

The program controls paragraph spacing, indents, and leading in $\frac{1}{100}$ -point increments. You'll find *XPress*'s tab controls more convenient than *PageMaker*'s, since you can easily display the ruler that shows the tab sequence.

You get a wide range of font sizes: from 2 to 500 points, compared to the 4- to 127-point range offered by most programs. Text can be screened in 6 shades of gray, with any one of 7 spot colors assigned. You can even insert *PostScript* commands and programs in an *XPress* document by using *PostScript Escape*.

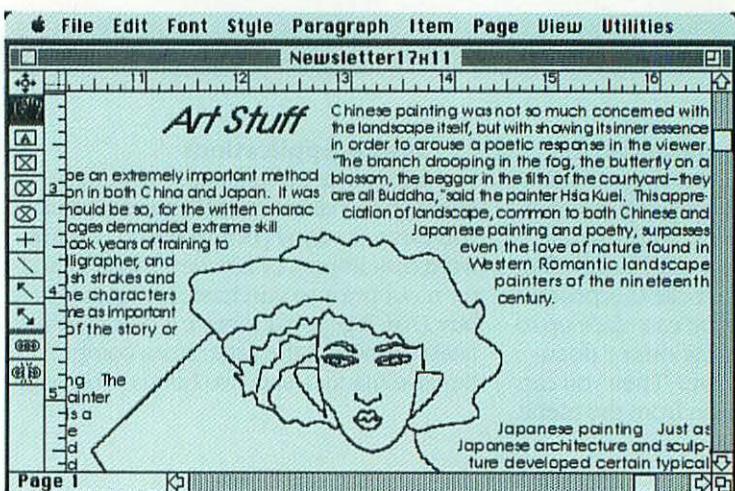
If you're an experienced word processor or typesetter, you'll appreciate *XPress*'s keyboard equivalents for all menu commands. You can kern letters, track spacing, center text, and change font sizes without ever leaving the keyboard.

Page Composition

Those familiar with desktop publishing know that *PageMaker*'s interactive style has become a standard in page composition. It's a familiar environment for pasteup artists: they can paste in text, graphics, lines, and borders, or draw directly on the page. But although *PageMaker* is best suited for single-page layouts and newsletters, its layouts can be difficult to manage, since there's no way to group the different layout elements.

High-End Versatility

XPress has an efficient stand-alone word processor that can automatically wrap text around regular and irregular shapes.



With *XPress*, though, you build pages as you would with *ReadySetGo* 3.0—by drawing frames to hold either text or graphics. You compose complex single-page layouts—logos, advertisements, brochures—in easily managed sections. *XPress* automatically groups multiple frames within a parent frame and treats them as a single unit when repositioning them.

XPress provides two ways to modify layouts: you can resize or reposition text or graphics frames from either the page or a dialog box. Instead of drawing borders directly on the page, you add them from the Frame menu. Frames can be lines, screens, or a selection from the Frame Editor, which consists of a library of borders and a FatBits-like editing tool.

XPress blends interactivity and batch pagination by specifying default pages (style sheets) and using the automatic page-insertion feature. With batch pagination, you can pour in an entire text file hundreds of pages long simply by placing the first column. Even on large jobs (such as books, catalogs, and manuals) *XPress* functions as an effective production manager because the number of files that can be opened at once and the size of files are limited only by disk space.

In the default page you can specify frame type, position, borders, or background, but text attributes—typeface, style, and size—must be assigned in your word processing file. Since you can't tag attributes, global formatting is impossible. This is probably *XPress*'s single most serious drawback. For example you cannot simultaneously change the size or style of all chapter headings as you can in *Ragtime*. *XPress* also slows down when editing long files because the text reflows each time you save new changes.

XPress automatically places text a preset distance from the column guide. You can import *MacPaint*, *MacDraw*, or *MacDraft* graphics, as well as *MacWrite* and *Microsoft Word* text, without losing your format settings. Graphics can be automatically placed within a frame, hand-cropped, proportionally sized, or moved.

Graphics and Printing

Because text automatically wraps around either a text or graphics frame or an arbitrary (irregular) shape, *XPress* gives you unlimited variation in layout design.

XPress at a Glance

General features

- Interactive tools
- Batch pagination
- Modifications with the mouse or from dialog boxes for greater precision
- Virtual memory system
- Automatic page insertion
- Automatic grouping within frames
- Online help
- Page importing from other *XPress* files

Word Processor

- Keyboard equivalents for all functions
- Search and replace
- User-definable tab fills
- Page-numbering formats that allow sectioning
- Control of interletter and interword spacing when fully justifying text

Page Layout

- Automatic grouping of frames
- Automatic text flow from column to column and from page to page
- Text wrapping around arbitrary shapes
- Font sizes: 2- to 500-point
- Text screening in 6 levels

- Color text
- Page size up to 36 by 36 inches
- Rulers with horizontal scale in inches and vertical scale in picas
- Step and Repeat command
- Frame library and frame editor
- Automatic or manual kerning in units of $\frac{1}{100}$ em
- Tracking in units of $\frac{1}{100}$ em
- Horizontal text scaling from 25 to 400 percent
- Leading in $\frac{1}{1000}$ -point increments
- Display of graphics in free-form windows
- Precise cropping of graphics by specifying numbers in a dialog box
- Arrows of any width, screen, or color; numerous broken-line patterns

Printing

- Color separations with optional registration marks
- Rough printing without graphics
- Printing negatives and mirror images
- Fine-tuning of printer resolution

Make sure you fully edit text before performing a word wrap, though, since the program may crash or incorrectly hyphenate when you're editing text that's wrapped around an arbitrary shape. Another of *XPress*'s flaws is its less-than-elegant method of cutting, copying, and pasting graphic elements (frames or lines). It has a Duplicate command and a Step and Repeat function for manipulating graphics, but unfortunately, they work only within a single page. Moving text between pages is an equally cumbersome process: you must first draw a text frame on the new page and then paste in the text. To match column widths, for example, you would record text-frame specs (size and position) from the

Modify window, re-create the text frame, respec the frame, and then paste in the text.

The Duplicate command functions like a macro, reducing the number of keystrokes required in the copy and paste routines. The Step and Repeat command lets you set horizontal and vertical offset positioning and the repeat count, automating repetitive work like drawing lines on a business form. Page sizes can be up to 36

by 36 inches with a manual mode that lets you display rulers with picas horizontally and inches vertically.

XPress also has features for maximizing the quality and productivity of *Post-Script* printers. Resolution is maximized by matching the gray screen resolution of halftones or scanned graphics (lines per inch) with printer resolution (dots per inch). You can assign spot colors to text, graphics, or borders for later output as color separations, with optional (printing industry standard) registration marks. You can even speed up the proofing process by printing documents without their graphics, using Rough Print.

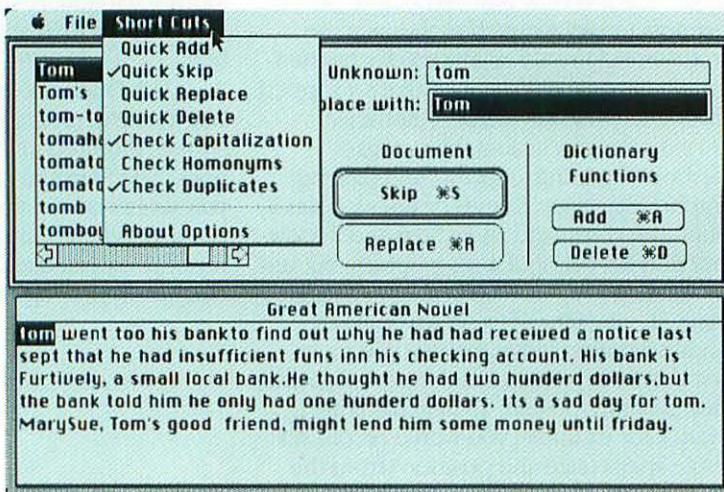
XPress's application-based bit-map smoothing routine is up to 10 times faster (and noticeably smoother) than typical printer-based smoothing routines. And *XPress* places no size restrictions on graphics to be smoothed—unlike *Page-Maker* and the Apple *LaserWriter*, whose limits are easily reached.

Despite some annoying bugs and a cumbersome copy-protection scheme that should be abandoned, *XPress* is still an impressive program. Its interactive tools are capable of subtle manipulation, and batch pagination simplifies handling large documents. And in future releases, Quark plans to add global formatting, a snap-to-base-line function for vertical justification, automatic table-of-contents generation, and an index. With its powerful word processor and comprehensive page-layout features, *XPress* will give you maximum flexibility for electronic layout, whether you're creating a single-page ad or a full-length illustrated novel.—Mike Krell

See *Where to Buy* for product details.

The Short Menu

With *Spellswell's* Short Cuts menu, you can activate or disable some of the program's customized features.



Check It Out

Spellswell 1.3j

Spelling checker: Pros: Runs fast; two dictionaries, one large; some special options. Cons: Cannot check interactively; does not suggest replacement words. **List price:** \$74.95. **Requires:** 512K. **Copy protection:** None.



The updated version of *Spellswell* from Working Software (formerly Greene, Johnson) improves on this stand-alone checker. In addition to retaining formats while checking *MacWrite* 4.5 and *Microsoft Word* 1.05 documents, it now works with *Microsoft Works*, *Lotus Jazz*, and *More*. (*WriteNow* and *Word* 3.0 will be added in the next release, which should be available by the time you read this.) *Spellswell's* main dictionary has been increased to 93,000 words, and it's stored on a separate disk. The program disk includes an abridged form (60,000 words). If you're working with only 400K and one disk drive, you probably have to use the smaller dictionary, which occupies only 187K. (The larger dictionary takes up 283K.)

Options and Short Cuts

Spellswell checks apostrophes, abbreviations, and hyphenation against its dictionaries, allowing such words as *Feb.*, *won't*, and *self-employed*. It will flag double-word errors when you mistakenly type the same word twice, and it includes an option for checking homonyms, which many spelling checkers do not.

The program also retains capitalization wherever it occurs and even requires

it for proper nouns, such as days of the week, or for capital letters in an abbreviation like *Pb.D*. You can test your document specifically for capitalization errors by using the Check Capitalization feature.

You can turn off any of these options with the Short Cuts menu, which enables the program to run faster and take up less disk space. In addition the Short Cuts menu allows you to bypass features that otherwise function automatically: Add, Skip, Replace, and Delete (see "The Short Menu"). It is particularly useful to disable the Replace and Skip dialog boxes, which normally appear after each item and ask you whether you want to replace (or skip, depending on the button you clicked) all occurrences of the word just checked. These dialog boxes make the program frustratingly slow when you have to click twice for every entry and decide on "all" instances of typos that will probably never occur again. Holding down the Option key while clicking the Replace button temporarily substitutes Replace All or Quick Replace for the option permanently selected.

Not Smart Enough

Spellswell moves rapidly indeed when given the chance because, when sufficient disk space remains, it holds your document in RAM rather than checking each word against the dictionary individually. You only have to wait when opening the program, as it reads, sorts, checks spelling, and resorts the document.

Unfortunately, the speed of version 1.3 is offset by a major flaw. Rather than suggesting substitutions for misspelled words, the program simply finds the nearest alphabetical listing. For example, to replace *terribly* it located *tergiversation*, although the dictionary contains *terribly*. This happens because *Spellswell* sorts mistakes according to the first two or three letters in the words. In addition the program can't deal with transposed characters, a major source of spelling errors for typists. To correct *ot*, *Spellswell* located *Othello*, the dictionary word that would follow *ot*. You must either scroll to find *to* or type in the word in the Replace With box. You can scroll through the entire dictionary, but it seems to take forever to find a correction similar to the

misspelled word. The next version of *Spells-well* will address this drawback with a Guess button that opens to a list of alternative words. While version 1.3 offers increased speed and a larger dictionary, the next release will probably be the one to buy.—Jeffrey Bartlett

See *Where to Buy* for product details.

The Perils of Normandy

Patton vs Rommel 1.05

War strategy game. **Pros:** Well-researched, playable game that takes many factors of battle into account. **Cons:** Without editing, the beginner level can be more difficult than the expert level.

List price: \$39.95. **Requires:** 512K, second disk drive recommended for saving games in progress.

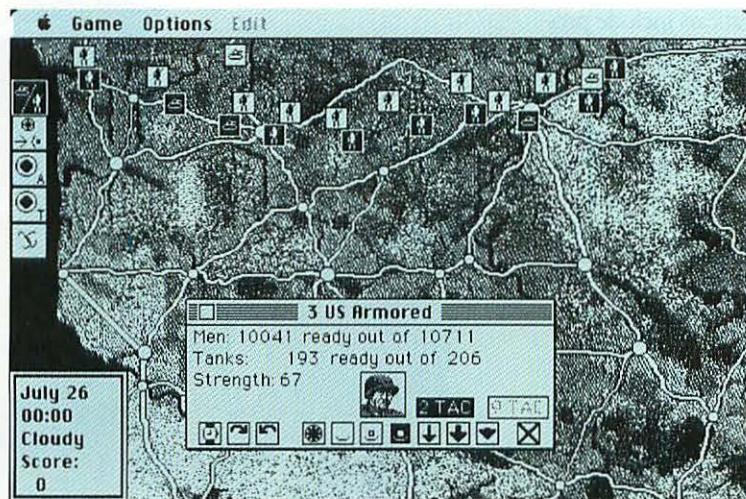
Copy protection: Not copyable.

 "It was summer 1944. The Allies had a beachhead at Normandy but were taking a pounding. On July 25, Operation Cobra began. Patton's 3rd Armored moved through St. Lo and got behind the German lines. By August 16, Avranches, Coutances, Bayeux—they all had fallen. The Germans were beaten."

Although Patton never met Field Marshal Rommel in Normandy, it makes for an interesting game scenario. *Patton vs Rommel* from Electronic Arts, the latest creation by game designer Chris Crawford, lets you explore how events might have transpired, had the charismatic generals actually opposed each other in World War II's most famous campaign. Like Crawford's other simulation games, *Patton vs Rommel* is well researched and complex. You manipulate armored and infantry divisions, decide where to concentrate bombers, contend with terrain, and decide when to attack and retreat. Generally speaking, you must make trade-offs between maneuverability and firepower. But despite the game's complexity, the fundamentals are easy to grasp, and it is quite playable.

Order of Battle

The game begins with Allied and German divisions deployed across from each other. Individual divisions are represented by square icons. As Allied commander you



must quickly overwhelm the enemy and obtain a positive score by occupying towns or destroying enemy troops. As commander of the Germans your challenge is to slow the Allied advance and keep the score negative. You have until August 16.

At the beginning of a turn you give each division its marching orders. The program supplies statistics on how many soldiers, tanks, or artillery units are available for combat. Up to ten types of commands let you control each division's movement and its disposition for combat; you can chain commands to create a series of actions for each unit.

When the battle begins, your forces attempt to carry out their orders. Some attacking troops will advance successfully, and others will be forced to retreat. During the battle you can change orders for divisions close to the commander's unit. Your prompt response to changing conditions can mean the difference between winning and losing.

Strategy

Attacking where your opponent is weakest is an age-old military adage. As the Allied commander you must break through at St. Lo and Lessay and get mobile armored units behind German lines. Be careful to guard against enemy divisions, which occasionally pop up out of nowhere and attempt to retake captured towns. Similarly, as German commander you can expect a strong attack at these points. Try to prevent Allied progress without making costly counterattacks.

Patton vs Rommel's major drawback is its lack of options at the beginner level, which actually makes it harder to play than at the intermediate or advanced levels. You can make the game easier to play by using

At the Front
Players enter orders in the small window at the bottom of the screen. By double-clicking on the white tank icon at the top left in this screen, you enter orders for Patton's 3rd Armored Division. Cloudy weather lets you attach one squadron of air support to a single division.

the edit function to change a division's strength, but the edit function is only available at the advanced level. Another pain is that because the program takes up a lot of disk space, battles in progress must be saved to another disk.

But such annoyances are minor compared with the game's overall fun. It took me about ten battles to win at the beginner level. After that I was nearly invincible; but the challenge was then to secure a major victory instead of a minor one. Such challenges should provide players plenty of war stories before they tire of battle.—Robert Buderi

See *Where to Buy* for product details.

Easy Ways to Excel

Excellent Exchange

Excel applications. **Pros:** Saves time and money over creating your own applications; inexpensive compared to stand-alone packages. **Cons:** Fewer features than stand-alone programs. **List price:** Templates, macros, and tutorials \$1 to \$100; Guided Tour, Check Book, and Personal Budget \$15 each; 15-program sample disk and catalog \$4. **Requires:** 512K, external drive, Microsoft Excel. **Copy protection:** None.



If you've purchased Microsoft Excel, and you either don't have the time to figure out how to program an application or hesitate to hire a programmer, one of Heizer Software's *Excellent Exchange* programs may be what you need.

The more than 250 applications include programs for accounting, business, finance, education, engineering, and manufacturing. Heizer Software sells individual programs through its mail-order catalog; retail stores carry template collections. The collections are grouped by subject category (Introductory Tutorials, Advanced Tutorials, Utilities, and Personal Resources); each one includes over 10 templates and costs \$50.

Developing an *Excel* application from scratch can be a frustrating affair, taking days for an inexperienced programmer. *Excellent Exchange*'s ready-made programs relieve you of many development headaches (although most people will have to do some relatively easy customizing) and let you get on with using *Excel*. Heizer also offers a number of tutorials.

Although the programs are written by free-lance developers, each is edited by Heizer Software. The eight examples I reviewed had the same general format and seemed to be free of documentation errors and bugs. Each package contains the name, telephone number, and office hours of its developer; the price of the software includes an unlimited number of support calls.

Excellent Exchange offers a wide array of task-specific templates and macros. Three fairly general programs that are among its most popular products are Guided Tour of Excel, Check Book, and Personal Budget.

Taking the Tour

Guided Tour of Excel is a relatively painless way to learn *Excel's* menu options. This two-hour training program gives you hands-on experience with each option, from the simple commands New and Open to the more complex Precision as Displayed and RICL. The explanations

Two Sides of the Tour

*Guided Tour of Excel
uses a split screen for
instructions and
practice.*



are clear, and the program illustrates how each function works and lets you practice using various functions.

The tour uses a split screen in which the tutorial shares the screen with a sample worksheet (see "Two Sides of the Tour"). You have to remember to alternate between activating the tutorial (to scroll

through it) and activating the worksheet (to carry out the instructions). Additionally, when the tutorial requires that you choose a complex selection from a dialog box, the dialog box obscures part of the instructions, forcing you to cancel the dialog box, reread and try to memorize the instructions, then access the dialog box again. But this juggling is still easier than shifting your gaze back and forth between the screen and a manual.

Guided Tour of Excel is far from being a soup-to-nuts tutorial. It does not explain how to set up a worksheet, nor does it provide a complete understanding of complex worksheet manipulations, such as the use of functions, macros, and text strings. Instead, it teaches you routine manipulation of worksheets and provides a foundation for learning more complex applications.

A Steady Balance

If balancing your checkbook is not among your favorite pastimes, Check Book is an easy-to-use alternative. The program is set up much like the standard register that comes from the bank with your

The figure shows a screenshot of Microsoft Excel. On the left is a worksheet titled "Projected Expenses" with data for January through March. The columns are labeled A through E, and the rows are numbered 1 through 20. The data includes rent, telephone, heat, light, and miscellaneous expenses. Row 19 contains a formula: =B18+C18+D18+E18. On the right, a separate window titled "Guided Tour" displays the text: "Welcome to the Guided Tour of Excel! This program is designed for new Excel users who want to become productive with Excel without spending long hours studying the two Excel manuals before first starting. It's design is based on the premise that many things can best be learned by doing them. You'll get a taste of everything Excel has to offer and actually use each feature yourself to do something. You'll still need the manuals after the tour, but hopefully more for reference than for detailed study. In taking this tour (designed to last about two hours), we'll touch on virtually all of Excel's main features. A simple worksheet

checks. After you enter data, you can choose to have Check Book arrange your checks and deposits in a number of ways, including by check number, by date, and by descending amount or descending deposit.

Check Book contains several special functions. The Type section provides a powerful means of classifying checks and deposits into categories that you determine. For example, you can choose the letter *D* to denote deductible expenses and *N* to denote nondeductible expenses. You can then subdivide the categories at several levels. This procedure enables you to produce both broad reports, such as all deductible payments, and narrow ones, like mortgage payments.

The Summary section gives you a simple summary of all checkbook activity, including number of payments, number of deposits, and balance. In conjunction with the Criteria section, it can provide a summary of the kinds of transactions you specify. An Extract section allows you to display and/or print all items specified in the Criteria section. These reporting features give you a lot of flexibility in summarizing income and expenses.

Proving Your Worth

If you need to know the state of your personal finances each month, Personal Budget can help. Input into the program is relatively straightforward: you type in up to 45 expense items and about 5 income items. It should not take you much longer than 20 minutes to enter information, but gathering and adding up various records can increase the time you spend by hours.

Once the figures are keyed in, Personal Budget keeps a running summary based on two ways of looking at your financial situation. *Net worth* is the total value of everything you own, including cash, minus what you owe. *Cash flow* is the amount of ready cash (or liquid assets) you have on hand. Net worth is a measure of long-term financial stability; cash flow is a measure of short-term health.

The expense and income items that you type in monthly are summarized by the software under the Total Income and Total Expenses columns. Total Income minus Total Expenses becomes Net Worth Change. The program then takes all cash transfers, like the part of your mortgage payment that actually reduces principal, and subtracts that from Net Worth Change to give you Cash Flow Change. This lets

you assess the changes in your net worth as well as determine whether you will be able to make a payment next week. Personal Budget also provides cumulative monthly summaries and quarterly and annual reports.

Actually, it wouldn't be hard for even relatively inexperienced *Excel* users to set up a program like this for themselves. But since Personal Budget is so inexpensive, why bother?

The Sum Total

The main advantage of *Excellent Exchange's* tutorials is that there are so many of them: the current catalog lists 22, and more are promised. This large selection allows you to define very specific areas of study, such as Font Sort and Date/Time/Calendar function.

Once you've committed yourself to investing \$395 in *Excel*, these templates and macros can save you both time and money. Since *Excel* is the basis for each, after you've learned to use one application, learning the next is much faster. And you can purchase these supplementary applications at a fraction of the price of equivalent software packages. These advantages make the templates an attractive alternative to stand-alone packages.—*Lawrence Stevens*

See *Where to Buy* for product details.

A Programming Language

APL Plus System for the Macintosh 1.0

APL language system. *Pros:* Completely implements the APL language for the Mac environment. *Cons:* Awkward to use on floppy-drive-based system. *List price:* \$395. *Requires:* 512K. *Copy protection:* None.

 *APL Plus System for the Macintosh*, from STSC, is a full-featured APL language interpreter that takes advantage of standard Macintosh features such as the Hierarchical File System (HFS), the Macintosh Toolbox, the Clipboard, and the Scrapbook. Based on the *PortaAPL System* developed by Portable Software, *APL Plus* is compatible with the STSC implementation for the MS-DOS environment, which allows relatively easy conversion of applications and programs.

```
ovr 'PRIMES1'
▽ Z←PRIMES1 N
[1]   A Find primes up to N
[2]   Z←(2=+/0=(1:N)∘.1:N)/1:N
▽
```

```
program primes;
CONST
  first = 2;
  max = 100000;
VAR
  sieve : PACKED ARRAY [first..max] OF boolean;
  leftin,range,factor,multiple : 0..max;
BEGIN
  read(range);
  FOR factor := first TO range DO
    sieve[factor] := true;
    leftin := range-first+1;
    factor := first -1;
  REPEAT
    factor := factor +1;
    IF sieve[factor]
      THEN
        BEGIN
          writeln(factor);
          multiple := 1;
          WHILE factor * multiple <= range DO
            BEGIN
              IF sieve[factor * multiple]
                THEN
                  BEGIN
                    sieve[factor * multiple] := false;
                    leftin := leftin -1
                  END;
              multiple := multiple +1
            END
          END
        END
      UNTIL leftin = 0
END.
```

APL, Pascal, and Prime Numbers

Compare these two programs for finding prime numbers—a standard Pascal program (bottom) and an APL Plus program that uses some tricks to achieve extreme compactness.

APL: The Language

A complete implementation of the APL language, *APL Plus* provides a powerful interactive programming environment for the development of large-scale applications. These are limited only by available memory to a maximum of 4 megabytes.

Critics of the language often gripe that the acronym *APL* stands for *a peculiar language*, while APL fans claim it stands for *a productive language*. A quick glance at the figure "APL, Pascal, and Prime Numbers" shows the language's strengths and weaknesses. APL notation is unique and unfamiliar, but allows for exceptionally

compact solutions to programming problems. In fact, one scientific publishing firm is said to have written its entire office-management system (mailing-list manager, bookkeeping system, and text editor) in four pages of APL code. A good APL programmer can produce impressive results in record time, but newcomers will have to invest some time learning the fundamentally different approach to programming that the language requires.

The power of APL is built upon the array as the basic data element, and a set of array-manipulating functions of remarkable scope. Consider, for example, the simple task of finding the minimum value in an array of numbers. A typical program in BASIC or Pascal would require a loop to input the numbers and then a procedure to compare each number with the preceding one to determine the smaller value. After all the numbers had been input and compared, the program would finally yield the smallest value. While that program segment might require eight or nine lines, in APL you could get the same result with a single-character command. That's because the language is based on these short commands, each with the power of a mini-program.

Most APL programmers do quantitative analysis and work on custom solutions for complex problems. Financial analysts and statisticians are typical users. In fact, several textbooks on statistical computing assume the availability of an APL interpreter for use in classwork, and mainframe versions of APL are popular in large government and industrial organizations that process mountains of data.

APL Plus: The System

APL Plus comes on two 400K disks, but you'll find 800K drives more convenient. Besides the interpreter itself, *APL Plus* contains a disk of "workspaces" for programmers, featuring sample and tutorial programs. An APL workspace contains variables, defined functions, and control information for an APL session. There is even a workspace for machine-level Mac access by APL and the Macintosh 68000 Development System (MDS) from Apple.

Three excellent volumes of documentation are supplied with the software: a language reference manual, a user's guide for Macintosh-specific information, and a tutorial optimistically entitled "APL Is Easy!" The tutorial guides the reader from basic definitions to exploring such topics as

table lookup functions and the *ravel* function, which converts a matrix into a vector. The package also includes a set of stick-on keytop labels for the Macintosh keyboard. The labels greatly simplify finding the special symbols (defined with Option and Shift-Option combinations) used in APL functions. A desk accessory also shows the APL keyboard layout.

Installation of the system is simple, and double-clicking the APL icon places you (and the keyboard) in the APL interpreter. In operation, APL behaves much like BASIC, with both an immediate execution mode and an interpreted mode. The difference is, the power of APL far exceeds that of BASIC.

In "APL, Pascal, and Prime Numbers," you can see the extreme power of the APL operators in defining functions. The Mac APL interpreter's execution speed is comparable to that of the *APL Plus System* interpreter running on an IBM PC. Interpreted programs are always slower than the best compiled versions of the same programs (APL is faster than BASIC and much slower than C)—the trade-off in APL is the ease of doing complex programming.

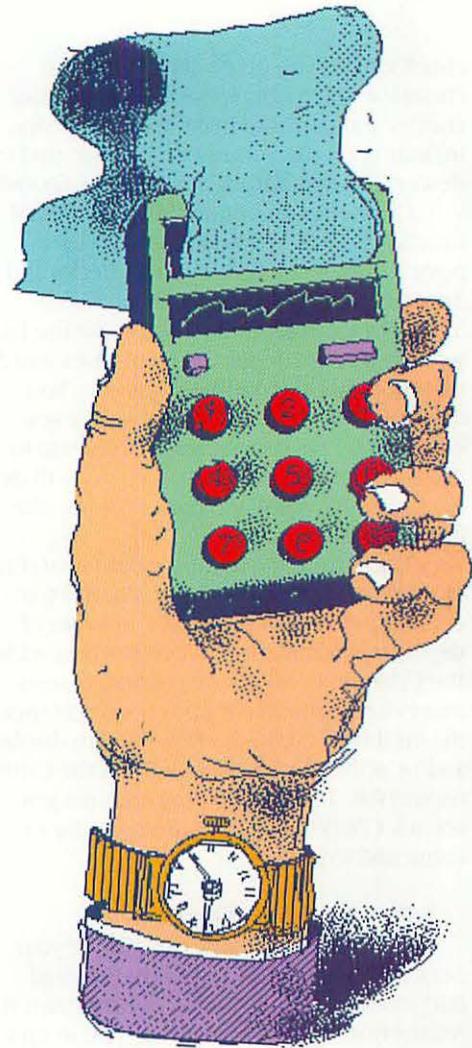
The only problem I encountered involved HFS paths and seems hardly worth complaining about. After I increased the default font size (to 20 points) from within the CONFIG workspace, the interpreter was unable to open files stored deep within other folders. The required path was simply too long to fit within the APL interpreter window. Returning to the original 10-point font size solved the problem.

APL Plus contains a complete communications package for accessing other APL systems. It supports speeds of up to 9600 baud, as well as the import and export of APL workspaces using the standard Workspace Interchange Convention. This standard allows the interchange of APL workspaces between different machines (such as an IBM mainframe and a Macintosh).

All in all, this product is highly recommended for Mac users who need the extensive analytical facilities of the APL language. STSC's APL interpreter is an excellent implementation of this peculiar and powerful programming language.

—Terry Ward

See *Where to Buy* for product details.



Billing Your Clients

Project Billing 1.21

Time- and expense-billing system. **Pros:** Detailed reporting; flexible searches; calculates interest rates on overdue balances. **Cons:** Deviates from Mac interface; data structure and entry counterintuitive; multiple data files prone to loss. **List price:** Version 1.35 \$695. **Requires:** 512K. **Copy protection:** None.



Many consultants and other professionals have a hard time getting their monthly invoices out on time. But while timely billing is essential to timely payment, managing the billing process also means tracking your accounts receivable and expenditures: who is to be billed and why. In this respect, a project billing program must function both as an accounting application and a database. *Project Billing*, by Satori

Software, is just such a package, and it's targeted for architects, designers, and consultants of all kinds. (For attorneys, Satori sells a similar product called *Legal Billing*.) It allows you to store client information, define projects, and apply time and expenditures to those projects. A range of invoices and reports can be generated, and you can print mailing labels.

Codes, Projects, and Actions

Daily data entry occurs in two overlapping windows, the Project and Action windows, to be manipulated later through numerous menu options. To use the program, however, you must first define your action and employee codes. Like a chart of accounts in an accounting program, you define actions in three categories: credits, expenses, and services. Simple actions might include items like "Payment Received," "Meetings," or "Blueprint Services." These are numbered for future shorthand reference when posting data to a project account. When defining an action you can enter a percentage—for marking up certain project expenditures—that's calculated automatically when it's time to generate an invoice or report. Markups can be global or specified for individual items, and they can be edited in the record field as well. Taxable actions can be flagged for the automatic addition of local sales tax. There's a limit of 63 action codes, which may be confining for a larger firm with diverse tasks to perform or with multiple project phases, each containing several actions.

After action codes, you set employee codes—up to 99—by number, name, hourly cost, and billing rate. This limit seems sufficient until you consider that some individuals may each require several codes for tasks billed at different rates. You can also edit actions or employee information after it has been entered.

Once this information has been defined, project account data with accompanying actions can be entered. Client information, project name, and billing options are entered in the Project window. Preestablished budgets for either services or expenses can be noted here, as can the amounts expended so far (in case you're starting up *Project Billing* during the middle of a project). Below these user-definable fields are the current charges

outstanding, the prior balance, and any applicable credits for services or expenses. The program itself completes these fields.

Options in the Project window include an automatic expense markup and interest rate for amounts past due. This feature is available in both the Project window and the Entry window for time and expense codes. Consequently, if you accidentally enter a percentage in both windows, the program adds them together, effectively doubling the markup. This problem could have been eliminated with an override function.

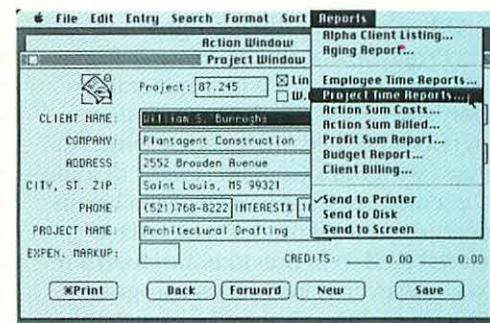
A key option enables you to link multiple projects for a single client, so that a consolidated bill can be printed. Another option, called Work In Progress (W.I.P.), allows you to maintain information about a project for more than a month. Like many accounts receivable programs, *Project Billing* normally prints invoices once a month and then clears the "action slips" you've entered for that bill. W.I.P. enables you to maintain a running record of all charges over the course of a project.

The Action window is where most of the action takes place (see "Entering Data"). Satori has used *clairvoyant* data-entry fields to speed the entry of information. You need only type in a few characters in the project field, and the program will search for the closest match. If one is found, related client and project information is automatically entered for you. To refresh your memory, you may also scroll through a listing of available codes and names for projects, employees, or actions in each field. Additionally, a fixed cost for time or expenses (or both) can be entered automatically or manually. Fractional hours are supported, with a limit of 99.99 hours

for any individual action slip. A third option—a timer that runs while you're completing a task—would be more useful as a desk accessory, since having to load *Project Billing* each time it's used is cumbersome, even with *Switcher*.

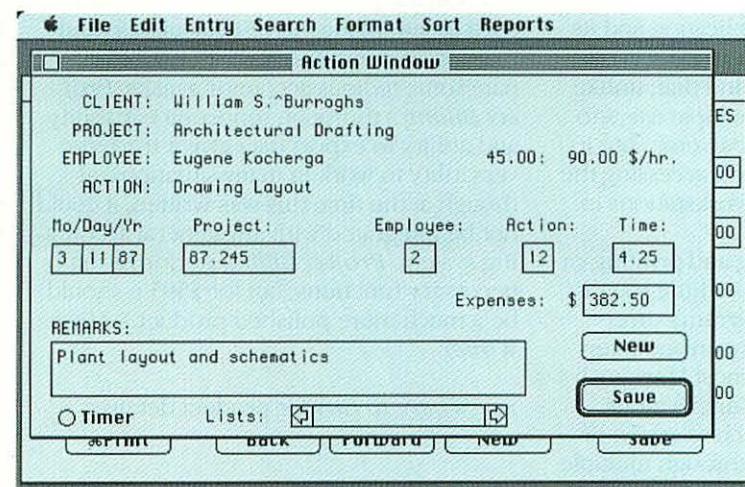
Searches and Reports

Searching and reporting are clearly *Project Billing*'s strong suits. The menus offer a broad range of predefined reports, and invoices may be printed with a variable amount of detail on charges. Searches for particular records can be defined by numerous parameters. Report categories allow you to review expenditures and revenues for projects, employees, or individual actions. Reports and invoices can be sent to a printer, to screen for instant review, or written to disk as text for use with a word processor. To avoid writing final bills prematurely (and clearing the action slips for the month), you can print a draft bill for review purposes. *Project Billing* has the un-



The Reports Menu

This provides many options and occasional confusion. The Project window shown here is a typical example of the information you capture with Project Billing.



Entering Data

Clairvoyant data fields speed the entry of project information in the Action window.

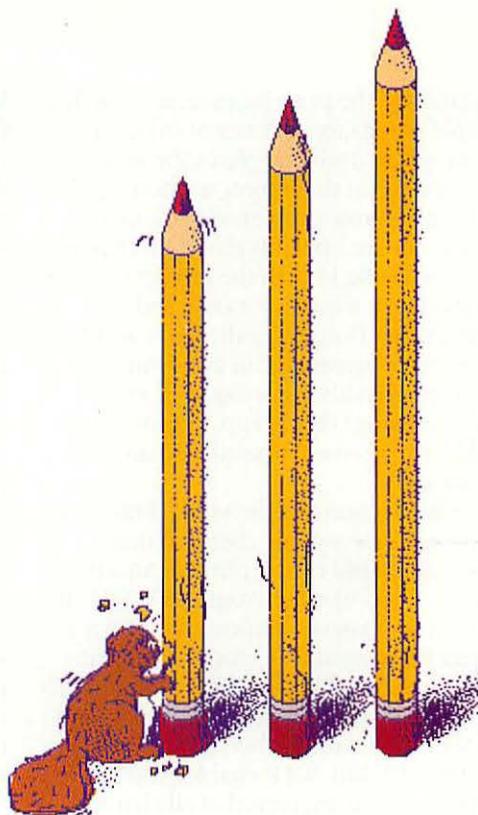
mistakable character of a sister product from Satori called *Bulk Mailer* and in fact can print mailing labels and envelopes, an important convenience.

On the negative side, *Project Billing* departs from the Mac interface conventions. The menu bar is organized so that printing functions, normally housed under the File menu, are under Reports, (see "The Reports Menu"). Under the File menu are commands for opening the various data files. An Entry menu lists windows for entering such information as a mailing address and the percentage charged for sales tax in your area. Other menu items allow the user to define searches, to format the information in reports, and to sort the entire database by date, project expenses, credits, or even by employees. Since you must choose among so many options, placing some of these standard settings in sub-windows or dialog boxes below the main menu would have simplified the program's appearance and ease of use.

Strengths and Weaknesses

Other project billing programs include *Professional Billing* from Chang Labs, which integrates with a general ledger; and *Office Productivity System (Ops)* from Applied Micronetics, which integrates with BPI's General Ledger module and is a multiuser application. Each has its strengths and weaknesses, which have been referred to in previous *Macworld* reviews. However, none of these programs allows for real-time entry of expense information while within another program, via a desk accessory. Such a feature would add significantly to the value of a time-billing application, particularly if it's a multiuser system supported on AppleTalk. *Project Billing* can be configured for use on AppleTalk with network programs like *MacServe* or *TOPS* by placing the application and its data files in a volume that can be served around the net. Keep in mind that, unlike *Ops*, this doesn't enable multiple users to access *Project Billing* concurrently, but it does provide a simple way of accessing the program from numerous workstations in sequential fashion.

For all of its reporting and printing capabilities, *Project Billing* is a little rough around the edges. The program's divergence from the standard menu and interface conventions used by most Macintosh applications is annoying. Furthermore, editing the data tables—such as action or employee codes—is done through multiple



nested windows, rather than directly through the tables. As a result, the program's design is in certain ways counterintuitive. Additionally, because you're limited to 1200 projects and 3500 action slips with either a hard disk or an 800K drive, further expansion would require another set of data files in a separate folder with its own program software to sustain another *Project Billing* system. Finally, the multiple data files it creates make the program more susceptible to information loss than a program using a single integrated data file. (*Ops* by Applied Micronetics has the multiple data files too; *Professional Billing* by Chang Labs creates a single file.)

On the positive side, valuable features such as automatic interest calculation and markup of reimbursable expenses eliminate some tedious accounting tasks. *Project Billing*'s thorough reporting capability and ability to export data give it the basic versatility to work in many situations, although at the time this was written, it could not be integrated with any general accounting system. *Project Billing* performs many necessary functions, but for \$595 it should be a much more polished product.—*Mark Winter*

See *Where to Buy* for product details.

Made to Specifications

MacSpec 2.0

Word processor for specifications. **Pros:** Automatic numbering of sections; flexible numbering scheme; ability to hide objects; print preview function. **Cons:** Imprecise layout tools; inability to make global changes; no Undo function. **List price:** \$199.95. **Requires:** 512K. **Copy protection:** None.



Some types of documents, like technical specifications, just aren't suited to general-purpose word processors like *MacWrite*. Because such documents are so highly structured, most of your time is spent formatting instead of writing. *MacSpec*, from LM Software, is a specialized word processor that automatically deals with the details of layout, letting you concentrate on content.

Tables of Contents

Specifications are typically composed of numbered sections, related to one another in a hierarchical scheme familiar to anyone who has used an outlining program. With *MacSpec*, you design a specification by building a table of contents (see "Organizing the Document"). Adding a section to the table of contents is easy. You place the cursor where you want to insert the section and select New from a pop-up menu. But positioning the rectangular cursor can be tricky—a horizontal arrow would have been better. *MacSpec*'s flexible numbering scheme enables you to represent up to eight section levels individually by number (1.2.1) or by letter (1.b.1). Each time you add or delete a section, the numbers of all succeeding ones change accordingly.

Laying It Out

You design the sections in a layout window by positioning three objects that represent the section's elements—number, title, and body (see "Section Layout"). Icons at the bottom of the layout window control the type of section (text or graphic), line spacing, text justification, and tabs. The gray rectangle icon is used to prevent an object from appearing in the printed document, a useful feature that lets you easily hide sections that may not be appropriate for a given document version without deleting them altogether.



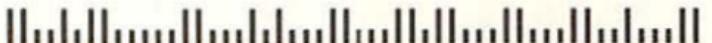
NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

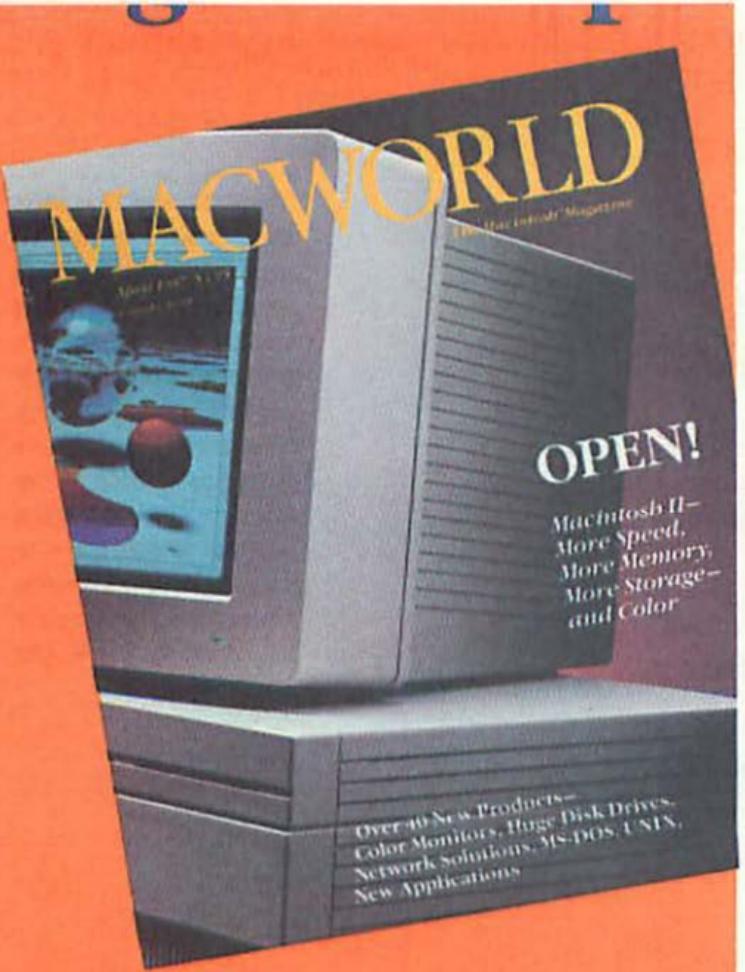
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Unfortunately, the layout process suffers from several design flaws. To move an object, for example, you have to select one of the tiny "knobs" on its corners—but not the one at the bottom right, which is used for sizing. And precisely positioning an object isn't easy, even with the horizontal and vertical rulers; at the very least, some sort of alignment tools (like *MacDraw's*) should have been provided. A more serious problem is the way new sections take on the layout of preceding sections of the same level. If you decide to change a *formatting* attribute, such as replacing section titles with italics instead of boldface, you have to go through the document and manually change each title. Font attributes of section numbers aren't inherited at all, but instead always revert to 12-point Geneva.

Words and Pictures

Once you've built the table of contents and laid out the section elements, you begin entering the contents (text or graphics)

in a separate window. *MacSpec* won't let you mix text and graphics in the same section, nor can you change a section of one kind into the other, even after deleting the contents. Text editing follows standard Macintosh guidelines, but there's no way to set a section's default font attributes. Also, the Undo function isn't implemented at all, and there are no Find or Change commands. *MacSpec* doesn't include a built-in spelling checker; the manual suggests that you save a text-only copy of a document to check it. I was able to use an interactive spelling checker (*Thunder*, from Batteries Included) without difficulty.

Customizing page headers and footers is similar to laying out section elements. You use up to six different objects (text, chapter, date, page, document name, and specification title) and can design even and odd pages. Sections can be grouped into chapters, each with its own prologue and epilogue containing a chapter number and text.

Setting page margins and printing are straightforward procedures. There's even a handy page-preview function to display a document on the screen as it will appear when printed. The 48-page manual is well written, but lacks an index.

There are a few minor inconsistencies in *MacSpec*'s design. In the header and footer windows, for example, objects are deleted by dragging them into the Trash Can; elsewhere, you remove objects by selecting them and choosing Cut or Clear from the Edit menu.

Spec Sheet

For creating simple technical specifications, you'd be better off using an outliner like *Acta* in conjunction with a word processor. For complex documents, particularly engineering, architecture, and military specifications, *MacSpec* lets you set up

a rigid format that others can easily follow—but its word processing capabilities fall short of a full-featured word processor, and its layout tools are imprecise. If you can live with *MacSpec*'s quirks, though, there's nothing else quite like it available.

—Franklin Tessler, M.D.

See *Where to Buy* for product details.

Seize the Data

Data Desk 1.04

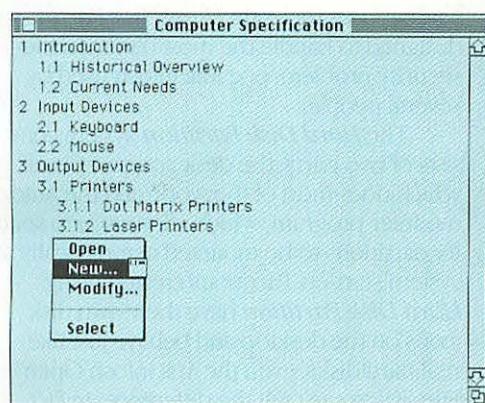
Statistical analysis package. **Pros:** Easy-to-use exploratory data analysis tool; excellent use of the Macintosh interface. **Cons:** Limited multivariate capabilities. **List price:** Professional version \$106 \$175 (student version \$38; library licenses available). **Requires:** 512K, 800K of disk storage on one or two drives (student version will operate on single-drive, 128K Macintosh). **COPY PROTECTION:** None.



Data analysis is both an art and a science—the art of discovering patterns in data, the science of applying calculations to derive the needed figures. *Data Desk*, a statistical analysis package from Data Description, stresses the art aspect. It uses the Mac's graphics to provide an overview of your data—a way to discover what the numbers mean before you launch into calculations.

Data Desk includes a full complement of basic analysis tools, including random-number generation, probability distributions, simple inference, two-sample tests (confidence intervals and t-tests), one-way and two-way analyses of variance, contingency tables, and correlation and regression (both simple and multiple). What the program lacks are functions for complex multivariate analysis, including factor and cluster analysis, a general linear model, and advanced models of analysis of variance. *Data Desk* can't replace full-featured multivariate statistical packages like *STAT80*, *StatView 512+*, and *SYSTAT*; professional statisticians will need a second package for calculations. *Data Desk* does provide easy exploratory analysis, to suggest an approach before serious calculation starts.

Data Desk views data analysis through graphs to afford painless, interactive development of an analysis. You can display data in histograms, scatterplots, box plots, and 3-D rotating plots. Graphing a variable immediately reveals the outliers (exceptionally

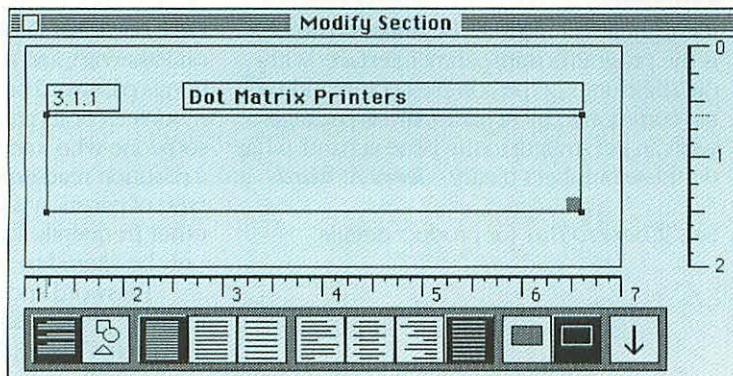


Organizing the Document

You set up and reorder sections in the table of contents window. A new section is added by choosing New from the pop-up menu. To change an existing section's layout use Modify. Choosing Open lets you edit the section's contents.

Section Layout

The section title is in bold type, the text single-spaced and fully justified. Subsequent sections at the same level automatically inherit this format. If you change the format later, however, changes will not be reflected automatically throughout the document.



large or small occurrences), robust statistical measures (occurrences that don't fall within assumptions), and residuals in a data set.

By manipulating the graph, you can bring out relationships you might not otherwise see. Narrowing the scale of a histogram window, for instance, increases the *y*-axis scale, accentuating differences between data. You can rotate a 3-D plot to find out whether a set that clusters along two axes stays equally close when viewed along the *z*-plane. If your graph shows a relationship among a particular set of cases, you can simply box the cluster of points and rebuild the graph using just those values or use a simple menu command to create a new selector variable using that group. The interface puts the data at the tip of your mouse pointer, presents it in context, and makes relevant information instantly accessible.

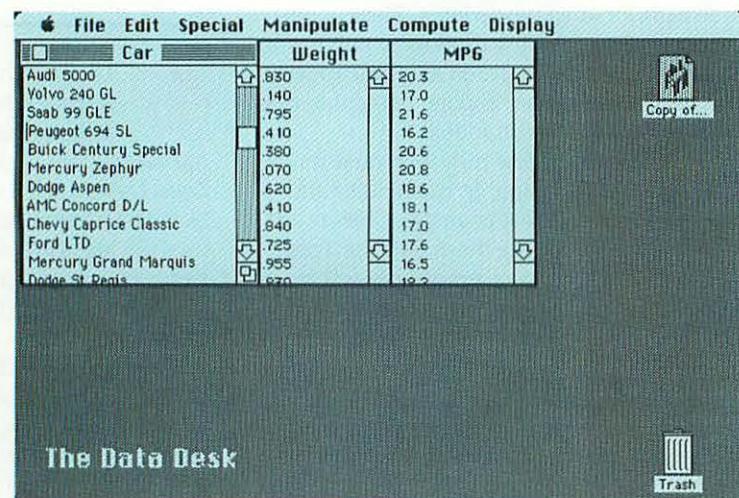
To edit or enter data you open the icon that represents a variable, revealing a text window that holds the values. Open variables are displayed in rows across the screen;

on how and when to use various statistical techniques and includes exercises in using each tool. In addition, excellent example data-files are included on the *Data Desk* disks. After program setup, professional statisticians will probably refer to the manual only in the rare instances when the use of the program is not immediately clear from the desktop.

A student version of *Data Desk*, containing all the statistical measures covered in a typical one-year undergraduate statistics course, is available from Data Description or from Kinko's Academic Courseware Exchange (\$38). This version lacks the data importing and exporting and 3-D rotating plots found in the professional version and is limited in data-set size to 15 real-data variables and about 1000 total numbers. (The professional version's capacity is limited only by storage, though the program slows to a crawl when using data sets with more than about 2000 values.) The scaled-down student version can run on a single-drive 128K Mac.

Variable Interest

Opening a number of variables creates a table of the data set. To enter data, you place the insertion point and type. When you press Enter, the insertion point moves to the corresponding row in the next variable's window.



The screenshot shows a Macintosh desktop with the *Data Desk* application window open. The window has a menu bar with File, Edit, Special, Manipulate, Compute, and Display. A sub-menu under File is visible, showing Car. The main area contains a table with two columns: Weight and MPG. The table lists various cars with their respective weights and fuel efficiency. The cursor is positioned over the first row of the table.

	Weight	MPG
Audi 5000	830	20.3
Volvo 240 GL	140	17.0
Saab 99 GLE	.795	21.6
Peugeot 694 SL	410	16.2
Buick Century Special	380	20.6
Mercury Zephyr	.070	20.8
Dodge Aspen	620	18.6
AMC Concord D/L	410	18.1
Chevy Caprice Classic	.840	17.0
Ford LTD	.725	17.6
Mercury Grand Marquis	955	16.5
Dodge St. Regis	670	19.2

The Data Desk

opening a few variables creates a table of the data set (see "Variable Interest"). When you scroll one window, the corresponding windows scroll with it, so you can view the entire set of data for each case. The program's Compute menu offers instant summary reports of a variable. By default, a summary report displays the mean, the standard deviation, and the number of values for the selected variable. You can choose from a host of other values to report, including measures of center, spread, and order.

Included with *Data Desk* is an excellent 220-page guide that is structured more like a textbook on basic statistical analysis than a software manual. It provides brief tutorials

It's a measure of *Data Desk*'s quality that it successfully straddles both markets, supplying sophisticated data analysis in a form neither too basic for professionals nor too difficult for statistics beginners. The key is the program's transparent interface. Without the clutter of the complex command syntax common to most data analysis packages, you can get straight to the issue at hand: what do these numbers mean? —*Terry A. Ward*

See *Where to Buy* for product details.

Fast Relief for Your Security Headaches

Hard Disk Partition 1.5

Hard disk partitioning system. **Pros:** Password and read-only protection; simple desk-accessory operation; partitions are nearly identical to ordinary disks. **Cons:** Does not adequately protect against theft or deliberate destruction of files. **List price:** \$54.95. **Requires:** 512K, serial or SCSI hard disk, Finder 5.2 or later version. **Copy protection:** None.

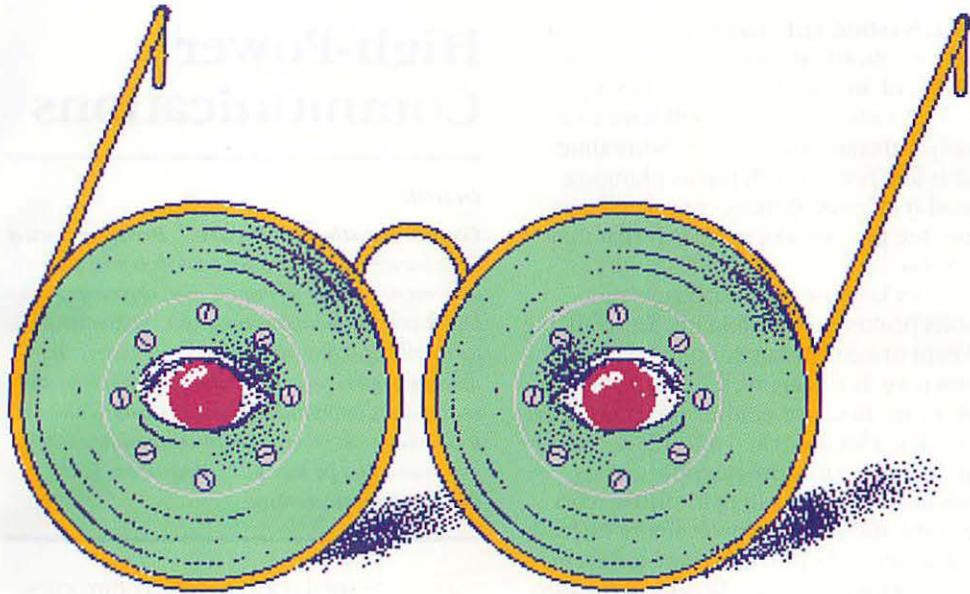


Simple, cheap, and effective—that just about sums up *Hard Disk Partition* from FWB Software. It's an easy-to-use but powerful desk accessory that lets you partition your hard disk to protect it from unauthorized use and to organize disk space more efficiently. *Hard Disk Partition* is designed to handle the most common file-security problem: one Macintosh used by several people.

The *Hard Disk Partition* system consists of two parts: the desk accessory itself, which does most of the work, and the Auto-mounter program, which allows you to specify partitions to be mounted automatically at system start-up. Partitions created using *Hard Disk Partition* have their own disk icons on the desktop and behave just like real hard disks; even the Macintosh Open File dialog can't tell the difference. In fact, *Hard Disk Partition* is so easy to learn that anyone who knows how to use a Mac can master it in just a few minutes. You get exactly what you expect; no obscure but important little tricks, no exceptions to the rule—even the documentation is simple and clear.

Password-protecting a partition is simple: just click on the Info button in the *Hard Disk Partition* Desk Accessory window, click on Password, and start typing. Once a partition is password protected, it can only be mounted (or its password changed) by someone who knows the password. Making a partition read-only is equally simple. This type of partition is great for databases and other frequently accessed files that should only be altered by authorized users.

Password and read-only protection effectively prevent accidental data loss and casual theft. Passwords don't show up on the



screen when they're typed, and starting the system from a floppy disk does not give you access to protected partitions the way it does with some other less secure protection programs. However, I did discover a significant crack in the armor that leaves files open to theft and deliberate destruction. Since partitions are actually invisible locked files, file-utility programs such as *MacTools* see them as both files and disks. When a partition is viewed as a file, it can be made visible, allowing it to be unlocked, copied, moved, or deleted by the Finder. When a partition is viewed as a disk, individual files within it can be copied or deleted using the file utility.

Getting It Together

When a hard disk is new and has a lot of empty space, its files are stored in physically contiguous blocks, which makes disk access relatively efficient. However, as you add new files and delete old ones, large blocks of space get used up and gaps of varying sizes occur between files. Finally, when there is no longer enough contiguous space to store a file, it's stored as a sequence of file fragments scattered around the disk wherever free space is still available. A partition created by *Hard Disk Partition* is not just a special directory of files scattered around the disk; it occupies a physically contiguous segment of the hard disk. Moving a file into a partition involves actually writing a copy of that file to a physically separate area of the disk. While the use of contiguous disk space increases disk efficiency, it also means that when you no longer have enough unused contiguous space to create a partition, you'll be forced

to do some disk housecleaning using either a backup/restore or a defragmenting program. Although you might prefer to partition all your files, using *Hard Disk Partition* isn't an all-or-nothing choice. You can divide up some files and leave others alone. Disk space not specifically allocated to a partition remains in the nonpartitioned area of the disk, and its files appear in the disk's standard Mac window.

Hard Disk Partition can cause a problem, though, if you try to unmount a partition that contains an open file; that often results in a system crash. An appropriate error message would obviously be preferable, but since no files are lost or damaged, it's really just a minor annoyance.

Hard Disk Partition runs on any hard disk, including the serial drives that require special boot-up programs, such as the Paradise and the old MacBottom. FWB Software has even provided a special version of the Automounter that operates with those disks. Furthermore, I have yet to find a program that is incompatible with *Hard Disk Partition*. It can even create MFS partitions that work with the few programs that have yet to be updated to the Hierarchical File System.

While *AppleShare*, *TOPS*, and *InfoServe* (as well as the soon-to-be-released new products from 3Com and other vendors) also provide file security, none of

them were designed to do what *Hard Disk Partition* does: provide reasonable file security within a multiuser/single-machine environment. *Hard Disk Partition* protects files from accidental loss or damage, theft, and destruction by the average user—but just don't expect it to thwart the hacker intent on getting into your files.
—Larry-Stuart Deutsch, M.D.

See *Where to Buy* for product details.

Gender-Specific Leather and Lace

Leather Goddesses of Phobos release 5.9

Interactive fiction (standard level with a few extra challenges). **Pros:** Witty writing and plot; comes with pair of 3-D glasses. **Cons:** No scrollback to previous text. **List price:** \$39.95. **Requires:** 128K. **Copy protection:** None.

Moonmist 4.0

Interactive fiction (introductory level). **Pros:** Excellent script and overall presentation; provides female and male viewpoints. **Cons:** No scrollback to previous text. **List price:** \$39.95. **Requires:** 128K. **Copy protection:** None.

Infocom's *Leather Goddesses of Phobos* and *Moonmist* are two high-quality but very different kinds of games. Both are excellent examples of text-only interactive fiction. *Leather Goddesses of Phobos* exudes an endearing galactic tackiness with its introductory 3-D comic book and scratch 'n' sniff card.

Leather Goddesses opens with an urge to go to the (scratch 'n' sniff spot #1) bathroom—Ladies or Gents—to determine a player's gender. Its lewdness is designed to appeal to both sexes. *Moonmist*, on the other hand, is a well-bred gothic romance that offers an introductory level of interaction primarily for girls between the ages of 9 and 16. (It also has a mode of play for boys.) What these two very different story games have in common are exceptionally good writing, inventive plots and puzzles, consistency of mood and attitude, and, I feel, respect for female players.

Laughable, Smellable Lewdness

Leather Goddesses of Phobos has three playing modes: tame, suggestive, and lewd. Despite its suggestive title, *Leather Goddesses* is neither sexist nor truly offensive. Its humor punctures the pretensions of the fantasy adventure genre. Be you hero or heroine, your quest is not for a magic wand and a sacred scroll; you're after some cotton balls, a length of rubber hose, and an outlet for your unspeakable lust. It's much more tongue-in-cheek than tongue kiss.

Your defeat of the *Leather Goddesses of Phobos* is a campaign likely to take months, for all the planet hopping and visits to Cleveland that are involved. The amusing and well-drawn 3-D comic book included with *Leather Goddesses* contains certain clues. At certain locations players have the option of sampling a smell. While some of the smells on the scratch 'n' sniff card are not instantly recognizable, players can take unparalleled pride in owning the Smell-O-Vision of interactive fiction.

Gothic Gollies

Cowritten by a former Nancy Drew/Hardy Boys author, *Moonmist* succeeds in emulating the classic youth mystery novels. Its puzzles and challenges are inventive and playful, and they complement the story without requiring advanced leaps and bounds of logic.

Interactive adventure games generally reflect the marketplace's domination by male-oriented products. *Moonmist* is one manufacturer's answer to this discriminatory imbalance. *Moonmist*'s gothic mood is created by "handwritten" letters, a diagrammatic tourist brochure, and an 11-page collection of tales that opens like a real book to a Victorian-style frontispiece. *Moonmist* features excellent pen-and-ink drawings reminiscent of an old-fashioned illustrated novel. The characters have names like Deirdre and Lord Jack, and they act differently and seek varying treasures in different versions of the story. There are four variations of *Moonmist*, each different enough so that repeated plays will still be enjoyable.

Invisible Ink and Literary Values

One problem with Infocom's format is the lack of any scrolling. If you don't print the text continuously, you will have to slow down and take careful notes. Sometimes that is just not as much fun as plunging ahead recklessly. Whichever way you go, there are puzzles along the way that may stop you.

As a last resort, inexpensive hint books printed in invisible ink are available. A latent image marker supplied with each book reveals the answers only to specific questions. Because neither program offers graphics, a lot is packed into 128K, including disk space to store multiple games. Both games are excellent for those who welcome the creative involvement offered by interactive fiction that emphasizes literary or satirical values.—Keith McCandless

See *Where to Buy* for product details.



High-Power Communications

***inTalk* 2.11**

Communications Software. **Pros:** Supports a wide variety of file-transfer protocols and emulates more types of terminals than any other Macintosh communications program; maximizes performance of many high-speed error-correcting modems; offers programmable function keys and automatic command sequences. **Cons:** Slower to load than most other popular communications programs. **List price:** \$199. **Requires:** 512K. **Copy Protection:** None.



Several good general communications programs exist for the Mac: *MacTerminal*, *Red Ryder*, and *MicroPhone* immediately come to mind. The main strength of these programs is the ability to perform routine tasks well. But what if you want to do something a little out of the ordinary? Such as look at the radar weather maps available on CompuServe, use a high-speed error-correcting modem at peak efficiency, or append received information to an existing text file? *inTalk* from Palantir Software (formerly *inTouch*) is a file-transfer and terminal-emulation program for the Mac that has more than just standard features: *inTalk* emulates eight terminal types (more than twice as many as other Mac communications programs) and offers five binary-file-transfer protocols—two designed for Mac-to-Mac transfers and three for Mac-to-other transfers—for greater flexibility. (The program also includes special support for high-speed modems with built-in error correction.) *inTalk* provides convenience features (such as a clock/online timer, a built-in text editor, and a command language) that make communication easier. The built-in text editor is similar to *Applelink*'s and enables you to create memos and short documents without going offline; command language scripts can automate repetitive communications tasks.

Protocols and Modem Support

In addition to standard text transfers, *inTalk* offers an array of binary-file-transfer protocols (see "Protocols for Binary File Exchanges"). Binary protocols, necessary for sending information more complex

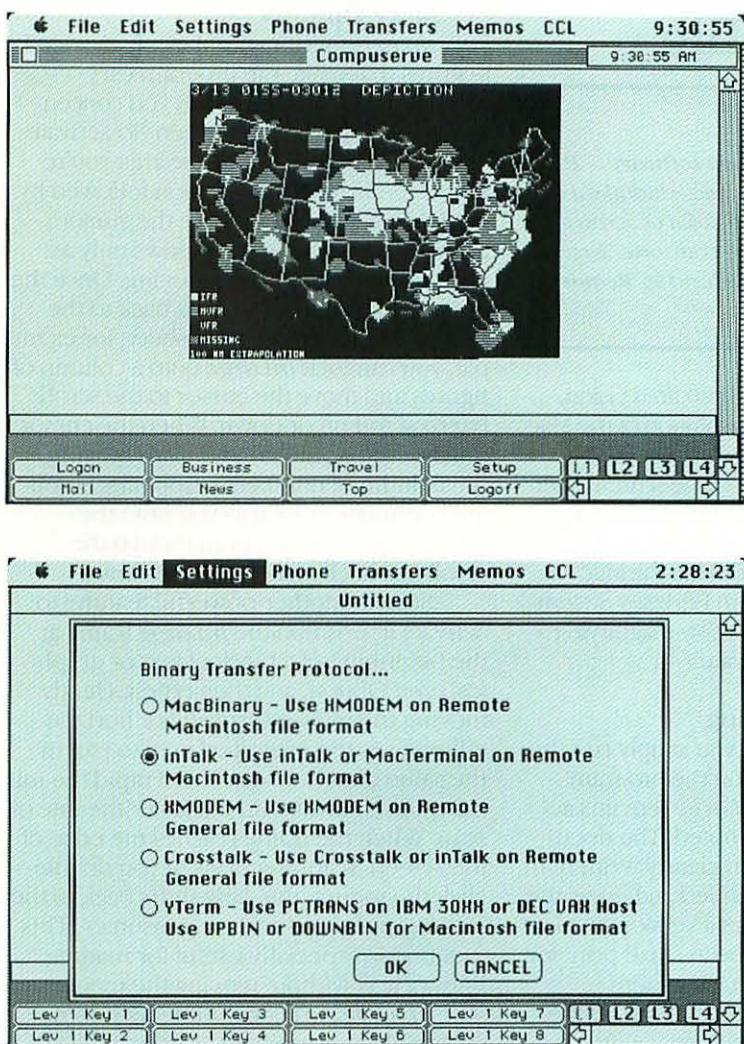
than ASCII text, are limited in other programs to two choices: a Mac-to-Mac binary protocol and Xmodem, a generic standard. *inTalk* offers an array of protocols that make successful file transfers between dissimilar computers more likely and more efficient. The *inTalk* protocol is designed to maximize performance when using high-speed error-correcting modems for binary file transfer between Macs; it leaves error correction to the modem and simply blasts data out the port at high speed. This special protocol also enables you to make unattended file transfers and works with *MacTerminal*'s binary protocol. *inTalk* lets you choose from Xmodem (also known as Modem7), Crosstalk, and Yterm protocols to transfer binary data that won't require Mac format again; these protocols transfer only the data fork. Xmodem and Crosstalk protocols are widely used by MS-DOS computers; Yterm transfers binary and text data from Macs to IBM mainframes and DEC VAXes.

Although designed to work with modems that use the Hayes AT command set, *inTalk* can be tailored to work with non-standard modems. Users enter the necessary command sequences via the Settings menu. The developers of *inTalk* built in special support for MNP error-correcting modems and PEP high-speed modems, like the DCA Fastlink and the Telebit Trailblazer.

inTalk is unique among Mac communications programs in its support for PBX-based data networks, such as Northern Telecom's Meridian SL-1. *inTalk* provides the long break signal (a break longer than 1.6 seconds) required for direct RS-422 connection to such systems, which are used in many offices. (The break signal is an ASCII control character used by many computers, especially mainframes, to interrupt or control certain communication processes.)

Other Features

inTalk's Communication Command Language (CCL) offers support for complex communication tasks by allowing users to automate repetitive command sequences, such as mainframe log-on dialogs. Similar to but more powerful than either *MicroPhone*'s script ability or *Smartcom II*'s Autopilot, CCL has many more commands and offers greater control over the communications process. For example, CCL allows you to specify the length of the break sig-



nal in tenths of a second. Because of *inTalk*'s built-in clock, a CCL script can program communication to take place at a certain time (such as 2 a.m.). The program comes with several sample scripts. Experienced BASIC users will find that CCL is not difficult to learn or work with. There are a number of debugging features that facilitate script development. *inTalk* also has a built-in text editor, which allows you to view, create, and modify text files without leaving the program.

inTalk has 32 on-screen function keys you can program to send any sequence of characters, including CCL scripts. As with *MicroPhone* and *Smartcom II*, the *inTalk* disk includes files preset for communication with the major commercial information services (Dow Jones News/Retrieval, CompuServe, The Source, etc.).

CompuServe Graphics

inTalk is the only Mac communications program that emulates VIDTEX, CompuServe's special graphics terminal, enabling you to display or print weather maps, news photographs, graphs, and charts from the information service.

Protocols for Binary File Exchanges

inTalk supports five different binary-file-transfer protocols. The MacBinary and *inTalk* protocols are primarily for Mac-to-Mac transfers. Xmodem, Crosstalk, and Yterm allow binary data to be exchanged between a heterogeneous array of Macs, PCs, and mainframes.

Because of its many features, *inTalk* is somewhat slow to start up and exit. The Macintosh watch icon does not appear while the program is loading, so you have no visual cue that the loading hasn't finished. If you are impatient and begin typing before *inTalk* is ready, the program simply ignores your keystrokes.

inTalk is a rarity: you don't have to give up features offered by its competitors to get those you need. Despite its many features, the program is quite easy to use; the manual is also well written. Because of *inTalk*'s support for increasingly popular high-speed error-correcting modems and its extensive array of terminal-emulation and file-transfer options, this program is likely to be the only communications program you'll ever need.—Nanci Hamilton

See *Where to Buy* for product details.

Making It Big

inLarge 1.0

Screen-image enlargement software. **Pros:** Very easy to install and customize; includes the ability to automatically scan down or across the screen. **Cons:** Not compatible with some "screen blankers" and games. **List price:** \$95. **Requires:** 512K. **Copy protection:** None.

 For people with impaired vision, even the high resolution of the Macintosh screen sometimes can't compensate for its small size. Large-screen external monitors that magnify the display have been available for some time, but they're expensive and require modifying the Mac. *inLarge*, a clever utility from Berkeley System Design, solves the problem by magnifying the screen through software.

Seeing Is Believing

To install *inLarge*, you simply run the application that comes on the program disk. Once installed, *inLarge* remains active until the Mac is rebooted. The documentation is concise and clearly written. In consideration of its intended audience, the *inLarge* manual includes a version in 24-point type, as well as one in small print for use with a closed-circuit TV system.

inLarge enlarges everything on the Mac's display 2 to 16 times. As you move the cursor, a different part of the enlarged screen comes into view inside a selection rectangle called the *inLarge frame*. (see "Magnification 2"). The scrolling action is smooth, and the magnified display is easy to work with once you get used to it.

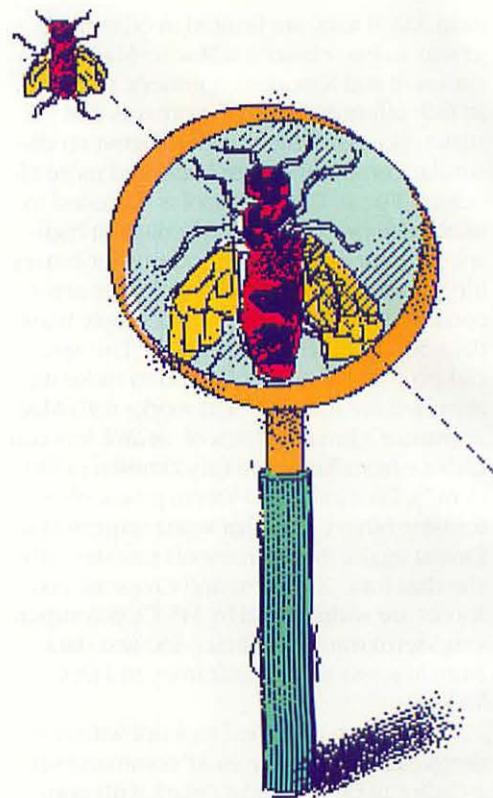
You control *inLarge* by pressing the Option key, which causes an icon to appear at the bottom right of the Macintosh screen. To set the degree of magnification, type a number between 2 and 16. You can choose to magnify the entire screen or just a small part of it. Pressing Option and then *o* turns *inLarge* off and on; typing *i* after the Option key reverses black and white (white letters on a black background are easier to read for some people with poor vision). People with visual-field defects can supplement the enlarged cursor with a full-frame crosshair by typing Option followed by *c*.

More Options

inLarge offers a number of advanced features that make the program very useful. The Lock feature lets you concentrate on one part of the screen. To activate Lock, move the cursor to the area you're interested in and press Option followed by the letter *l*. When you move the cursor away, the *inLarge* frame follows only as long as the mouse keeps moving. Once the cursor stops, the view snaps back to the original region. In a spreadsheet, for example, you can lock *inLarge* onto a column of figures and move the cursor to the scroll bar to scroll up or down. When the cursor reaches the scroll bar and stops moving, the column of numbers reappears. Scrolling continues as long as you hold the mouse button down, even though the scroll bar itself is no longer in view.

Scan is another powerful feature; to activate it, position the *inLarge* frame at the beginning of a block of text or graphics, type Option, and then type *s*. Gently moving the mouse vertically or horizontally causes the magnified area to pan in the same direction—the more rapid the initial mouse movement, the faster the rate of scan. When the frame reaches the edge of the screen, scanning stops. If you double-click the mouse, the view shifts back to the starting point and scanning resumes. This function is especially useful for reading lines of text without moving the mouse.

inLarge isn't compatible with some screen blunker utilities (like the public domain *AutoBlack*), and the results of magnifying some games are interesting, to say the least. When *inLarge* is turned off, the screen response is somewhat sluggish, but



since *inLarge* can be easily removed by rebooting, this isn't a serious problem.

inLarge is an elegant, inexpensive way for people with impaired vision to enjoy the Mac's user interface without resorting to expensive add-on monitors. If it works with your applications (and I suggest you try them before buying), *inLarge* is truly a sight for sore eyes.—Franklin Tessler, M.D.

See *Where to Buy* for product details.

Magnification 2

inLarge lets you magnify your screen display up to 16 times. The desktop on the left is 2 times its original size (shown below).

Dataframe 20

9,996K in disk

-  DAs & Fonts
-  D&S Folder
-  System Folder
-  Powerhouse
-  VIP Folder

Dataframe 20

9,962K in disk

-  DAs & Fonts
-  D&S Folder
-  System Folder
-  Powerhouse
-  VIP Folder



YES, THEY TOO ARE HAYES COMPATIBLE.

Our idea of "Hayes Compatible" has nothing to do with other modems and everything to do with personal computers. Which is

the reason why
Hayes modems are
compatible with over
100 different personal



computers, including all Apple® computers.

For the Apple II, II+, IIe, IIC and IIgs, we offer the Smartmodem 2400™ and Smartmodem 1200.™ Or the internal Smartmodem 1200A.™ a modem that plugs into Apple expansion slots for fast, economical 1200 bps operation. And our new Smartcom I, powerful menu-driven software with autodial/autoanswer and XMODEM protocol, brings out the best in both Apple computers and Hayes modems.

Our Smartmodem 2400 and Smartmodem 1200 are also compatible with all versions of the Apple Macintosh,™ including the Macintosh Plus, Macintosh SE and Macintosh II. There's even a specially bundled package for the Macintosh that contains a Smartmodem 1200, modem cables and Smartcom II® software. Smartcom II is our award-winning software specially designed to take advantage of the power and graphics capabilities of the Macintosh.

Last but not least, there's another feature that Hayes 2400 and 1200 bps modems offer that will make them even more compatible with Apple computers, and that's a new low price.



Hayes.

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11, it won't be any easier easier to express them.



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tures, Ready, Set, Go! 4.0 will help you make a raw concept blossom into a newsletter of finished elegance. Transform random brainstorms into a report of symphonic coherence. Or create a dazzling business presentation from a jumble of brilliant insights.

And although other software packages may talk about doing all

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ESSELTE

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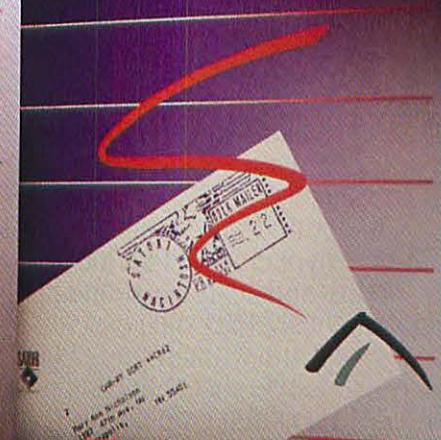
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New Products

Information on the Mac's latest software, hardware, and accessories

Edited by Eileen Drapiza

New Products includes Macintosh products that have been formally announced but not yet evaluated by *Macworld's* editors. All prices are suggested retail prices. Please call vendors directly for information on availability.

SOFTWARE

Air Warrior An interactive, multiplayer aerial-combat game from Kesmai Corporation. Available on GEnie. 512K minimum memory. Free with subscription to GEnie. GE Information Services, 800/638-9636 ext. 21.

C.A.T. Relational database that integrates contact, activity, and time management. 512K minimum memory; Mac Plus recommended. \$399.95. Chang Labs, 408/246-8020.

CineWrite Word processor and storyboard program designed specifically for advertising, film, and TV production. You can use preset, two-column script formats or create your own. Storyboarding features include the ability to use drawn, scanned, or digitized visuals and match them with corresponding scenes and shots. Also matches shots with visuals of camera setups, angles, and blocking diagrams. Lets you play back with wipe effects in real time, so you can see your production before shooting starts. 512K minimum memory. \$495. Developed in France by Parisoft; distributed by Max3 in the U.S., 213/276-7682.

Coloring Book & Clip Art Software Two volumes of full-page clip art, including illustrations of dinosaurs, dogs, cats, and horses. Volume I or II \$12.95; both for \$24. Bede Tech, 216/631-4214, 800/772-4536.

Course Builder Visual programming language that lets you use text, graphics, animation, and sound to design interactive courseware. 512K minimum memory; external drive recommended. \$299. Tele-Robotics International, Inc., 615/690-5600.

Douglas CAD/CAM A low-cost printed-circuit-board layout and manufacturing system. 512K minimum memory; requires 1200-baud modem. Basic system \$95; with ImageWriter or LaserWriter printing option \$395; with option to drive various other printers and pen plotters \$525. Call for quotes on manufacturing. Douglas Electronics Inc., 415/483-8770.

Eureka: The Solver Solves inequalities, plots graphs of functions, converts units automatically, and solves equations that include derivative operator and proper integrals. Includes standard trigonometric functions, as well as logarithmic, exponential, statistical, and financial functions. Designed specifically for the scientific, engineering, business/financial, and educational communities. 512K minimum memory. \$295. Borland International, 408/438-8696.

Financial Decisions One hundred twelve stand-alone *Excel* templates for financial managers and investors. Eight modules include Appraisals, Bonds, Depreciation, Investments, Lending, Mortgages, Sales, and Savings. 512K minimum memory. \$45 per disk. GenMicronics, 603/664-9020.

Great Plains Network Manager Enables customers to use the Great Plains Accounting Series on more than one workstation si-

multaneously while protecting the integrity of the accounting information. 512KE minimum memory; requires AppleShare. \$395. Great Plains Software, 701/281-0550.

HeartLab Simulation software that teaches cardiac auscultation. Package includes a sound filter and headphones. 512K minimum memory. \$149. Harvard Medical School Decision Systems Laboratory, 617/732-6508.

Kieran Integrated software for children aged 2 to 6. Five interactive programs emphasize such areas as the alphabet, counting, telling time, and computer skills. Functions are completely mouse-driven, and instructions are given by a synthesized voice. 128K minimum memory. \$39.95. Ohm Software, 401/253-9354.

LaserPaint Complete PostScript graphics and text environment for creating camera-ready artwork. Includes modules for drawing, painting, writing, and pasteup. Produces automatic color separations on the LaserWriter. 512KE minimum memory. \$495. LaserWare, Inc., 415/453-9500.

MacInTax Planner Supplement to *MacInTax* 1986. This five-year income-tax planner reflects the Tax Reform Act of 1986. Allows "what if" calculations for maximizing investment decisions. Transfers data easily from *MacInTax Planner* to *MacInTax* 1987. 128K minimum memory. \$79. Soft-View, 805/388-2626.

MacShammes Fully integrated synagogue management system. Includes membership profiles, a Yahrtzeit module that translates dates from the Hebrew calendar

(continues)

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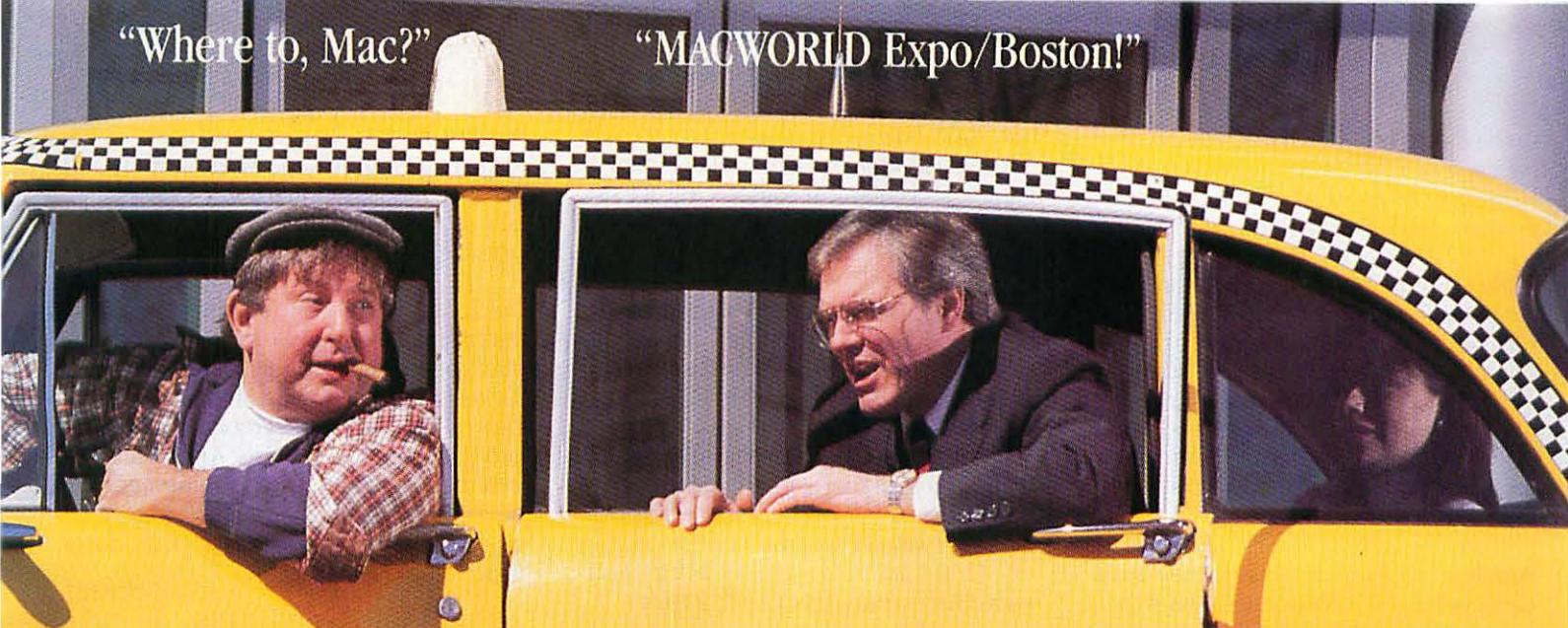
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Our exhibitors list. (As of April 1, 1987.) A who's who of people who design, develop and produce hardware, software and peripherals for Macintosh. 3Com Corp., Abaton Technology Corp., Addison-Wesley Publishing Co., Adobe Systems, Inc., Advanced Computer Graphics, Advanced Elec. Support Prod., Inc., Affinity Microsystems, Ltd., Aldus Corp., AlSoft, Inc., Altys Corp., Ann Arbor Softworks, Apple Programmer's & Developer's Assoc., Ashton-Tate, AST Research, Inc., Avantec, Inc., Bering Industries, Inc., Berkeley Macintosh Users Grp. (BMUG), Blackhole Technology, Inc., Blowhard Industries, Blyth Software, Inc., Borland International, Boston Computer Society, Boston Publishing Systems, Inc., Bravo Technologies, Inc., C.I. Tech International, Inc., Cambridge Electronics, Inc., Capilano Computing Systems, Ltd., CasadyWare, Inc., CE Software, Centram Systems West, Inc., CHA Services, Inc., Chang Laboratories, Inc., CMS, Cognition Technology Corp., CompServCo, Compu-Tech, Inc., CompuCover, Computer Expressions, Computer Museum, Computer Shoppe, Computer Shopper Magazine, Computer Ware, COMTREX, Ltd., Consular Corp., Cortland Computer, Cricket Software, Inc., Data Tailor, Inc., DataSpace Corp., Dayna Communications, DEST Corp., Digital, Etc., Inc., Dove Computer Corp., Dynamac Computer Products, Inc., Dynamic Graphics, Inc., E-Machines, Inc., E.I. duPont de Nemours & Co. (Inc.), Educomp, Erez Anzel Software, Ergotron, Inc., F.C. Brooks & Co., F.I.L., Farallon Computing, Ferranti-Dege, Inc., First Desk Systems, Inc., Flexware, Forethought, Inc., General Computer Co., Great Plains Software, Great Wave Software, Hayden Books/Howard W. Sams & Co., Hayes Microcomputer Products, Inc., Heizer Software, Hewlett-Packard Co., High Performance Systems, Inc., I/O Design, Inc., ICOM Simulation, Icon Concepts The Macazine, IDAC, Inc., ImageWorld, Inc., Infosphere, Inc., InfoWorld, Innovative Data Design, Inc., Intelitek, Internet, Invention Software, Jasmine Computer Systems, Kensington Microwave Ltd., Kent Marsh Ltd., Kinetics, Inc., KMW Corp., Kroy Sign Systems, Language Processors, Inc., Language Systems Corp., Laserware, Inc., Layered, Inc., Letraset U.S.A., Levco, Linotype Co., Living Videotext, LoDOWN, Logic eXTension Resources, Lotus Development Corp., Lundein & Associates, Mac Buyer's Guide/Ridgegate Comm. Corp., MacBrieft, MacMemory, Inc., Macropac International, MacFutor, MacUser Magazine/Ziff-Davis Pub. Co., Mainstay, Mani Software Systems, Inc., Meta Software Corp., Micah Storage Systems, Micro Planning International, MicroGraphic Images Corp., Microsoft Corp., MicroStore, Mindscape, Inc., Mirror Technologies, Monogram Software, Inc., Nantucket Corp., National Association of Dsktp. Pub., National Instruments Corp., Northeast Data Processing Supplies, Odesta Corp., Office Talk, Orange Micro, Inc., Palantir Software, Panamax, Paragon Concepts, Inc., PC World Communications, Inc., PEAK Systems, Peripheral Land, Peripheral Systems, Inc., Personal Bibliographic Software, Inc., Personal Computer Peripherals Corp., Personal Training Systems, Practical Computer Applications, Inc. (PCAI), Pro Plus Software, Inc., Prometheus Products, Inc., Quark, Inc., Radius, Inc., Relax Technology, Ribbon Land, Rodime, Inc., Peripheral Systems Div., Satori Software, Scott, Foresman/Little Brown, Silicon Beach Software, Inc., SmathersBarnes, SMS, SoftView, Software Disclosures, Inc., Solutions, Inc., Spectrum Holobyte, Springboard Software, SuperMac Technology, Symmetry Corp., Systat, Inc., T/Maker Co., Tacklind Design, Inc., Target Software, Inc., TeleRobotics International, Inc., The Macneal-Schwendler Corp., The Madson Line, The Rest of Us, THINK Technologies, Inc., TMI Systems, Inc., TPS Electronics, Typesetting Service Corp., Unicom, Washington Apple Pi, Ltd., White Pine Software, Inc., WordPerfect Corp., Working Software, Inc., Ziyad, Inc. And there are more to come! MACWORLD Exposition/Boston is the original Macintosh computer show. It's sponsored by MACWORLD, the Macintosh™ Magazine, a member of the CW Communications/Inc. family.

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MathType Tool for creating mathematical equations to be incorporated into word processing and desktop publishing documents via the Clipboard. Works either as a desk accessory or a stand-alone application. You can edit and extract equations previously developed with *MathType*. 512K minimum memory. \$149; demo disk \$10 (applicable to purchase). Design Science, 213/433-0685.

Medical Dictionary for Spellswell Over 35,000 words and abbreviations, including anatomical, medical, dental, psychiatric, nursing, and veterinary terms, phar-

maceutical drug names, major drug trade names, major pharmaceutical company names, and chemical names. Only for use with *Spellswell*. \$99.95. Working Software Inc., 408/375-2828.

MenuFonts Desk accessory that displays font names in their own fonts in the pull-down Font menu. 512K minimum memory. \$15. Beyond, 602/323-4547.

MergeWrite Designed to be used with *MacWrite* as a mail merger for creating personalized form letters. Accepts data from *RecordHolderPlus* and other data managers. 128K minimum memory. \$49.95. Software Discoveries, Inc., 203/872-1024.

Monogram Exporter Enables *Dollars and Sense* users to export data to text files. 128K minimum memory. \$15.95. Star/Monogram Software, Inc., 213/533-1190.

Point 'n' Click Inventory and invoicing system. 1MB minimum memory; requires external drive. \$295. FineGrove Ltd., P.O. Box 11863, Tel Aviv 6116, Israel. No phone number listed.

Practica Musica Teaches basic music skills through melodic dictation, ear training for intervals, and harmonic theory. Uses digitally sampled sound. 512K minimum memory. \$125. Periscope Press, 805/564-2518.

Quick Ceph Diagnostic system for orthodontists that helps evaluate X-rays and conduct cephalometric analysis. Includes Ricketts, Steiner, Tweed, McNamara, Downs, Jarabac, Björk, Frontal Analysis, and User-Defined Analysis. Also includes treatment simulations. 512KE minimum memory. Software license \$895, annual upgrade fee \$195, digitizer \$895. Orthodontic Processing, 714/370-2357.

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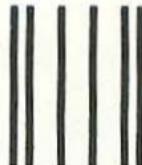
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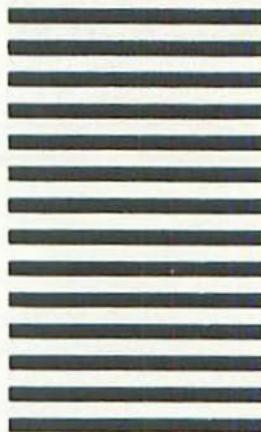
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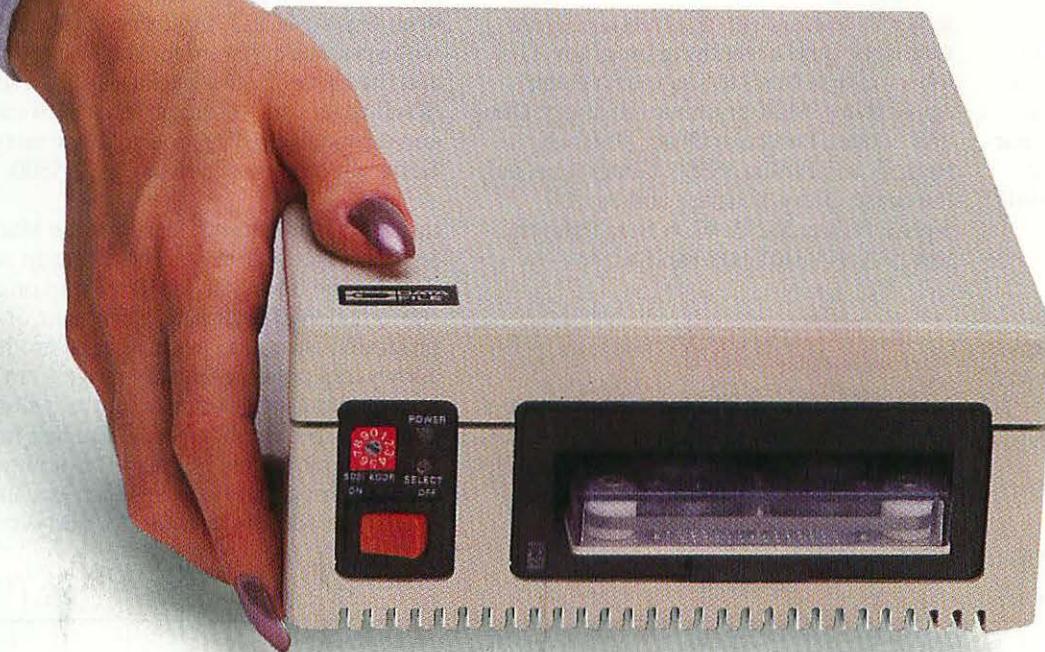
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timization, differentiation and integration, integral transforms, data handling, approximation and data fitting, and statistical and probability functions. 512K minimum memory; fixed disk recommended. Annual site-license fee \$750; annual license fee for a single machine \$300; limited license \$350. C. Abaci, 919/832-4847.

Scoop Desktop publishing program that includes a full-featured graphics package, built-in *MacLightning* spelling checker, and a complete WYSIWYG text editor. Enables you to wrap text around or fill irregularly shaped graphics. Offers automatic hyphenation and automatic slanting of margins, fractional font sizes, and automatic and manual fractional kerning. 512K minimum memory. \$495. Target Software, 305/252-0892.

Sentinel Data security software that displays locked files as locked icons on the desktop. Features password protection and two levels of file encryption. 512K minimum memory. \$74.95. SuperMac Software, 415/964-9694.

Terrapin Logo Uses windows and pull-down menus. Graphics windows support multiple turtles, each of which may be

given its own shape, pen size, and pen pattern. Users also have access to many Macintosh QuickDraw routines. Programming features include multidimensional arrays, property lists, strings, stream I/O, automatic load-on-call, and extended CATCH and THROW primitives. 512K minimum memory. \$79.95; 10- or 20-packs for \$399.95 or \$699.95, respectively. Terrapin, Inc., 617/492-8816.

WOS/CTB/McGraw-Hill Fund Accounting A multiuser fund accounting program. Allows multiple Macs to share data using *AppleShare*. 512K minimum memory. General Ledger, Purchase Order Voucher, Payroll, and Billing \$5995; General Ledger, Purchase Order Voucher, and Payroll \$4995; Billing \$1295. WOS Data Systems, Inc., 913/843-8101, 800/843-8101.

HARDWARE

BackPak 40 This 40MB hard disk permanently attaches to the back of the Mac Plus; acts like an internal drive without the noise of a fan. It is 1½ in. thick and weighs 3 lb. \$1299. Jasmine Technologies, Inc., 415/621-4339.

8110-A Gateway Enables the Mac to access IBM host computers. Provides protocol conversion and file transfer for up to eight asynchronous devices. Emulates an IBM 3274 cluster controller unit. \$2850. Case Communications, Inc., 301/290-7220.

HyperDrive FX/40 An external 40MB SCSI hard disk for the Mac Plus, the Mac SE, and the Mac II; designed to function as a personal hard disk and as a file server with both *HyperNet* and *AppleShare*. Comes with spooling software for the ImageWriter and the LaserWriter, a backup utility, a set of self-diagnostic routines, and a SCSI cable and terminator. \$1799; one-year warranty. General Computer Corp., 617/492-5500.

Inspector Debugging board for the Mac SE. Users can set breakpoints using an address range from 2- to 16MB, or trap on any combination of read data, write data, or program instruction fetch. Special mode allows trap on write-outside range from an instruction-inside range. Features include event counter, memory cycle counter, full 8-bit programmable I/O port. Trap output available for oscilloscope trigger, or can be used as an address decoder for add-on

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TO GET OUT
OF THE DARK.

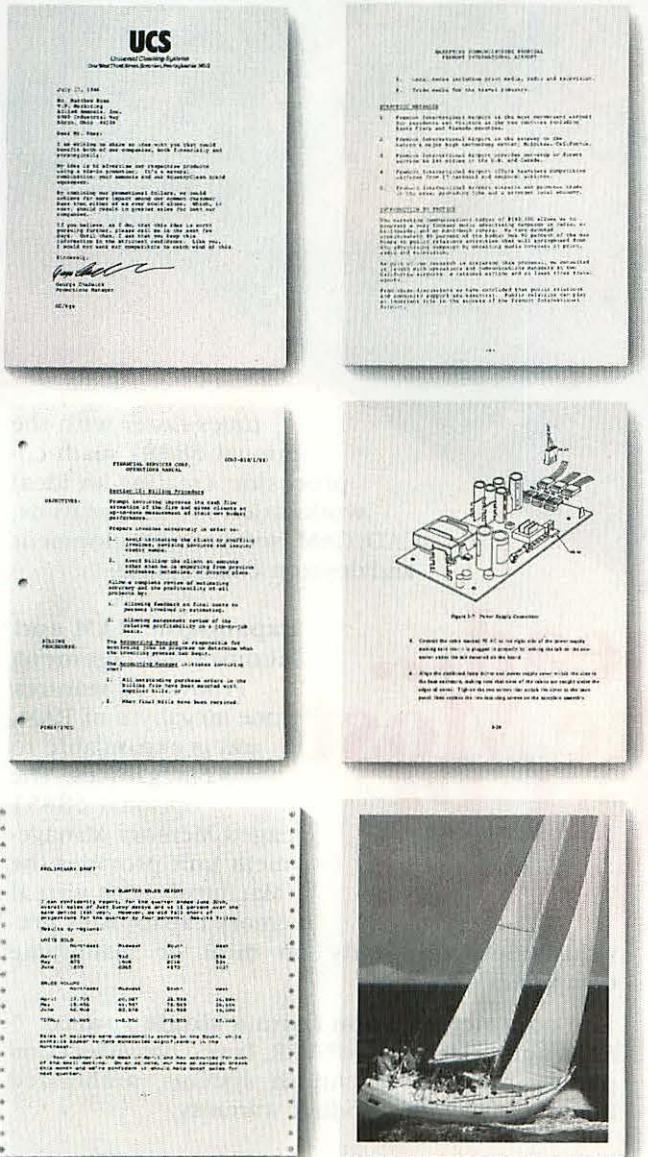


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hardware prototyping. Includes cable extenders and source code. Seawell Microsystems, Inc., 206/938-5420.

The Jam Box/4 Combination hardware/software package that synchronizes MIDI sequencers to SMPTE time code. The interface is rack mounted, and includes 4 MIDI ins and 4 MIDI outs. Controlling software installed as desk accessories within the sequencer program. 512K minimum memory. \$399. Southworth Music Systems, 617/772-9471.

Jasmine SCSI Hard Disk Series Jasmine 40MB \$999, Jasmine 50MB \$1159, Jasmine 160MB \$3499. Jasmine Technologies, Inc., 415/621-4339.

MegaDrive High-speed SCSI drive with 10MB 5½-in. removable cartridges. Hard-sectored so you can reinitialize without losing data. \$999; MegaFloppy \$39.95; 3-pack \$109.95; includes flip storage case. Jasmine Technologies, Inc., 415/621-4339.

Monochrome Video Board Offers screen resolution of 1024 lines × 1024 dots × 1 bit. The video adapter enables users to connect the Mac II to any standard monochrome TV monitor or any monochrome monitor offered by Apple. Under \$500; call for exact pricing. Jasmine Technologies, Inc., 415/621-4339.

MultiTalk Serial device server that allows any Mac connected to AppleTalk to share three asynchronous serial peripheral devices. 512K minimum memory. \$699. Abaton Technology Corp., 415/463-8822.

PhD 82MB removable/fixed-disk subsystem. 20.5MB removable cartridges. Access time approximately 25 milliseconds. \$5495. Century Data Systems, 714/632-7500.

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Macintosh By Robert Eckhardt. Illustrated 432-page paperback book describes over 1000 public-exchange software programs. \$19.95. Crown Publishers, Inc., 212/254-1600.

Macinware SE A padded Cordura carrying case designed to accommodate the Macintosh SE with keyboard, an Apple SCSI/Hard Disk 20 or hard disk drive with similar dimensions, and an external disk drive. Available in navy blue or slate gray. \$129.95. I/O Design, Inc., 215/524-7277.

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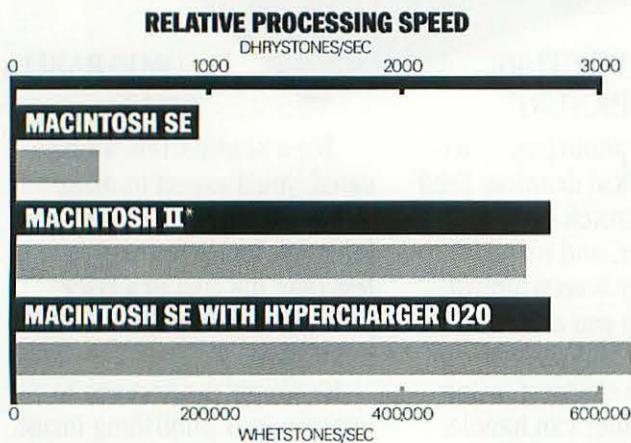
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Circle 143 on reader service card



Quick Tips

Answers to your questions

by Lon Poole

Recently I was talking to the head of a company that manufactures SCSI disk and tape drives sold under several different popular brand names. This behind-the-scenes guy requested anonymity, but he knows SCSI inside and out. He warns that it is very important to turn off all SCSI devices before changing connections.

The SCSI port is actually a connection to an active bus, much like the NuBus slots in a Mac II or the slots in an Apple II. No one would think of adding or removing cards in those computers without first turning off the power. But many people think that because you plug a cable into the SCSI port, it is just another kind of serial port. In fact, plugging and unplugging SCSI devices while the power is on creates transient voltages that damage the delicate circuitry in the Mac and in many peripheral devices. It's not a question of whether damage occurs but of how much damage occurs, so shut down properly and switch off all devices before changing the cabling.

No ID

A program can identify what type of Macintosh it's running on, as I described in the April 1987 *Quick Tips*. But Brad Pierce of Sherman Oaks, California, claims that my answer missed the point of the question. Does the ROM contain an electronic serial number that uniquely identifies each logic board? No, individual logic boards do not have electronic serial numbers. If you need to identify particular Macintoshes, you'll have to come up with another scheme, such as a password, a key disk, or a custom device that attaches to a serial port.

A Mac Abroad

Headed overseas with your Macintosh system? Don't leave home without a multi-outlet power strip. That's the advice of

Andy Williams, who has been living in West Germany since November 1986. After reading my comments in the March 1987 issue about using a Mac outside the United States, he wrote to report his experiences. He carried his system as checked baggage, first bagging the Mac and the ImageWriter in soft carrying cases and then packing each in separate cardboard boxes, surrounded by foam. The excess baggage cost extra, but it was worth it, he claims. He suggests you contact the customs service at your destination well before you depart, to see what documents you'll need in order to avoid paying an expensive duty (for details on obtaining a carné, see "The Macintosh Passport," *Macworld*, November 1985).

ImageWriter II and IBM PC, Take 3

The "Making Connections" table in the January 1987 *Quick Tips* showed how to wire a cable for attaching an ImageWriter II to an IBM PC. The table identified the connections by pin number. However, the 8-pin minicircular plug needed for the ImageWriter II bears no pin numbers. For pin numbers, see "Connections." It shows the back side of the plug, the side to which you solder the cable. The view from the

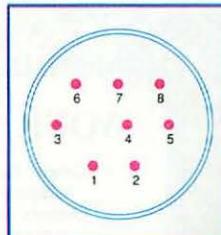
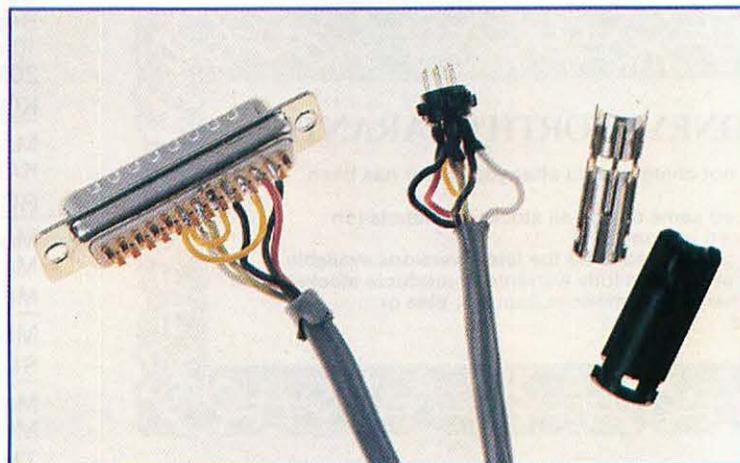
front of the plug is a mirror image of the figure, a fact that eludes and confuses some cable makers. Thanks to Philip J. Muench, of Urbana, Illinois, for noticing the missing pin-number diagram.

Q **Wide Lines by a Narrow Margin** *MacWrite* does not let me print or write as far to the left on the page as I know the ImageWriter can print. Which word processing programs will allow me to use the full width of the page by setting margins at the extremes?

W. I. Feller
Ottawa, Ontario
Canada

A According to my tests, *LaserAuthor* allows left and right margins as small as $\frac{1}{4}$ inch on $8\frac{1}{2}$ -inch paper, so it can print an 8-inch line (the ImageWriter's maximum). *WriteNow* and *Microsoft Word* 3.0 both let you set side margins down to 0, resulting in a wider text area than the ImageWriter can print. *MindWrite* lets you type lines 8 inches or longer. But when you

(continues)



Connections

To convert an ImageWriter cable for the IBM PC, attach an 8-pin minicircular plug.

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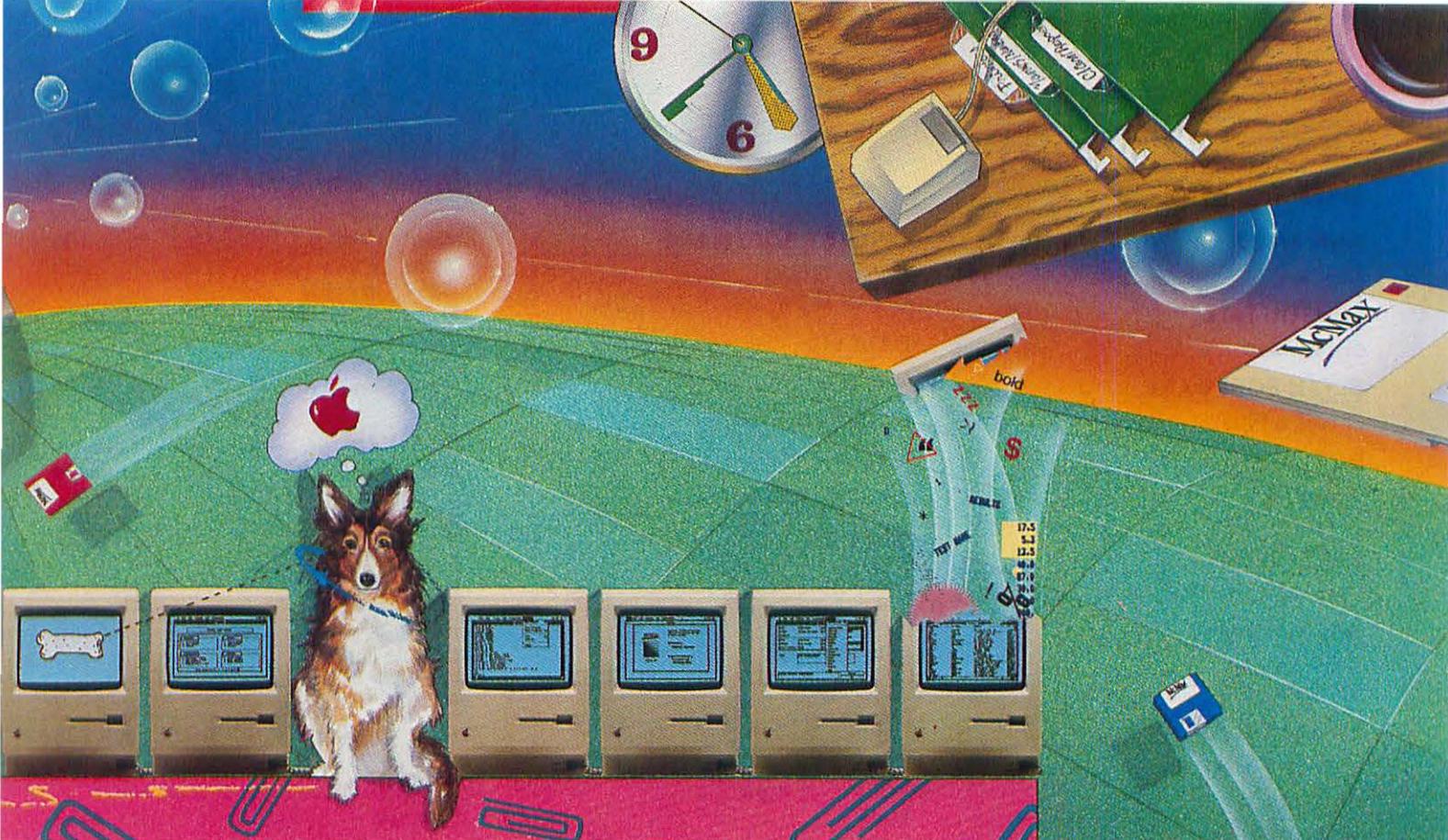
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print, it automatically shortens the lines to $7\frac{1}{16}$ inches by widening the right margin.

For details about these word processors, contact the publishers: *LaserAuthor*, Firebird Licensees, Inc., P.O. Box 49, Ramsey, NJ 07446, 201/444-5700; *WriteNow*, T/Maker Co., 1973 Landings Dr., Mountain View, CA 94043, 415/962-0195; *Microsoft Word*, Microsoft Corp., 10611 N.E. 36th Way, Box 97017, Redmond, WA 98073, 800/426-9400, 206/882-8088 in Alaska and Washington, 416/673-7638 in Canada; *MindWrite*, MindWork Software, P.O. Box 222280, Carmel, CA 93922, 408/624-0522.

Q Text for Mainframes

Many of us have to talk to IBM mainframe computers that have archaic electronic mail systems and text editors. When I send documents to my mainframe, I am restricted to lines of 68 characters or less, and each line must end with a single Return. I write all my reports on my Mac Plus and then send them to the mainframe using *SmartCom II*. Many word processors let you set line length, but when they wrap text at the end of a line, they do not insert a Return. This causes a line overflow error on the host system.

MacWrite puts a Return at the end of every line if you use the Text Only option when you save a document. But lines that already have a Return (at the end of each paragraph) end up with two. Unacceptable.

The best solution I have found is to use *QUED* version 1.53 with the Monaco 12 font and a line length of 68. After typing, I show the invisible characters and press Return at the end of every line that doesn't already have one. It's a pain.

It's funny: I can use 24-point fonts, paste in graphics, and print on a laser printer, but I can't create simple ASCII files. Why?

Anthony J. Oresteen
Batavia, Illinois

A Word 3.0 can save any document as plain text with exactly one Return at the end of each line. Choose Save As from the File menu, click the File Formats button, select the Text Only with Line Breaks option, type a file name, and click Save. To get 68 characters per line, set a line length of 6 inches, with a 12-point monospace (nonproportional) font such as Monaco 12 or Courier 12.

You can write documents using any word processor capable of saving plain

text, if you use the right terminal program to send the documents to the mainframe. *MicroPhone*, for example, breaks lines at whatever length you specify and can insert a single Return at the end of each line. To set this up, choose File Transfer from *MicroPhone*'s Settings menu. Then enter the line length you want in the box labeled Word-wrap Outgoing Text To and select CR (Return) for the End Outgoing Lines With option. Finally, use the Send Text command in *MicroPhone*'s File Transfer menu to send your plain text file to the mainframe.

For more information on *MicroPhone*, contact Software Ventures Corp., 2907 Claremont Ave. #220, Berkeley, CA 94705, 415/644-3232.

Q Flaky Disk Drive

I have a two-year-old 128K Mac that I recently upgraded to 512K. A few months ago it began doing strange things. Sometimes when I put a start-up disk in the internal drive, a sad face appears with the code "0F008." Sometimes a System error occurs with ID 02. But if I put the same start-up disk in the external drive, it works correctly.

The people at my local computer store could not find anything wrong with my machine. However, they admit that they have very little Mac-repair experience. Do you have any idea why my machine would have trouble starting from the internal drive and what the sad face could mean?

Connie Lull
Smith Center, Kansas

A If you can start up reliably from the external drive but not the internal drive, the internal drive must be flaky. You might be able to cure the problem by cleaning the drive with one of the commercially available drive-cleaning kits. However, the symptoms you describe are almost identical to those I experienced with my 512K Mac about a year ago, and cleaning did not help. Local repair shops said the drive might need realignment but should probably be replaced. I elected to have the Mac Plus 800K Disk Drive Kit installed. That gave me twice the disk capacity of a 400K drive, not to mention the increased performance of the Mac Plus ROM.

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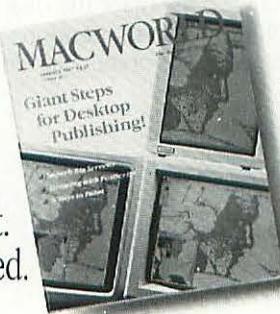
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Dynamic Selection

Tip: Excel's SELECT function normally will only accept a parameter that is fixed before execution (a "compile-time" parameter), such as SELECT (!A3). But a running macro often needs to select a cell dynamically (a "run-time" parameter), such as SELECT (desired_cell). This limitation is particularly restrictive because of the need to select so often.

I wrote a macro to get around the limitation by constructing the desired SELECT formula entirely from text (see "Self-Modifying Macro"). After that, the macro uses a FORMULA function to insert the constructed SELECT formula near the end of the executing macro itself. This self-modifying method of using the FORMULA function to allow run-time parameter passing should be applicable to other functions that are normally limited to compile-time parameters, such as FORMULA.GOTO.

One way to use this macro is within a macro that generates a database on a worksheet. In an income or expense database, for example, you could enter an amount in an entry-form area of a worksheet, along

A	B
1 SelectCell	cell to be selected is a reference-type argument
2 =ARGUMENT("the_ref",8)	determine row number of cell to be selected
3 =SET_NAME("row_num",ROW(the_ref))	determine column number of cell to be selected
4 =SET_NAME("col_num",COLUMN(the_ref))	construct formula that will perform dynamic selection
5 =SET_NAME("select_text",=SELECT("R"&TEXT(row_num,0)&"C"&TEXT(col_num,0)&""))	temporarily activate this macro sheet window
6 =ACTIVATE("SelectTestMacro")	select a cell in macro sheet to put constructed formula in
7 =SELECT(A10)	put formula in selected macro sheet cell
8 =FORMULA(select_text)	reactivate worksheet window
9 =ACTIVATE("SelectTestSheet")	execute the constructed formula that was put here
10 =SELECT("R3C4")	done
11 =RETURN()	
12	
13 TestMacro	This macro demonstrates SelectMacro
14 =SelectCell(D3)	Use macro to select cell D3
15 =RETURN()	

Self-Modifying Macro

The SelectCell macro modifies itself by constructing a text formula (cell A5) and inserting that

with a code indicating the type of expense or income. The macro would use the code to determine where on the worksheet the amount belongs, and use the SelectCell macro to select that cell. This would greatly simplify data entry for a complex worksheet.

Carl J. Madson
Menlo Park, California

Word Spacing for Tight Fits

Tip: I do résumés professionally, and I have learned a technique that saves me a great deal of time and effort when writing.

When I must maintain my horizontal margins and do not want to change the font

formula into itself using a FORMULA function (cell A8).

I am using, I can squeeze in that extra word without adding another line to my document by simply reducing the font size of the spaces between the words rather than the actual words themselves. This applies to vertical spacing too. When one more line will push you to a second page, try reducing the font size of the blank lines between paragraphs to make it all fit on one page.

Robert Battle
North Babylon, New York

(continues)

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Compressed BASIC Weight Loss

Tip: Microsoft BASIC (version 2.0)

programs saved in the compressed format take up less disk space and load faster than do programs saved as text. Unfortunately, compressed programs can eventually take up much more disk space than they actually require. This happens because MS BASIC stores all variable names that have ever been entered in a heap at the end of the program. If you change or delete a variable name from the program, MS BASIC remembers the old and new variable names. Likewise, it remembers as "new" variables any variable names you mistype.

You can clear out the extraneous variables by saving the program as text, closing the program, reopening it, and saving it again in compressed format. This eliminates all unused variable names, reducing the size of the program on disk.

Andrew D. Burt
Atlanta, Georgia

This tip also applies to MS BASIC 3.0.

Long Keyboard Cable

Tip: You can use a long phone cable for your keyboard, but you must reverse the wires in the cable. This is useful when you're showing an Excel spreadsheet on a large projection screen, for example.

Stephen Hull
Evergreen, Colorado

You may not have the tools to install a modular connector upside down at one end of a long telephone handset cable, or the inclination to cut and reverse the wires in the middle of the cable (black to yellow and red to green). In that case, you can buy a long keyboard cable ready-made. The Berkeley Macintosh Users Group (1442A Walnut St. #62, Berkeley, CA 94709, 415/849-9114) sells a 12-foot cable for \$7. Tacklind Design (250 Cowper St., Palo Alto, CA 94301, 415/322-2257) sells a 16-footer in several colors for \$8.95. Of course none of these options work on the Mac SE and the Mac II, which use a different keyboard cable and connector.

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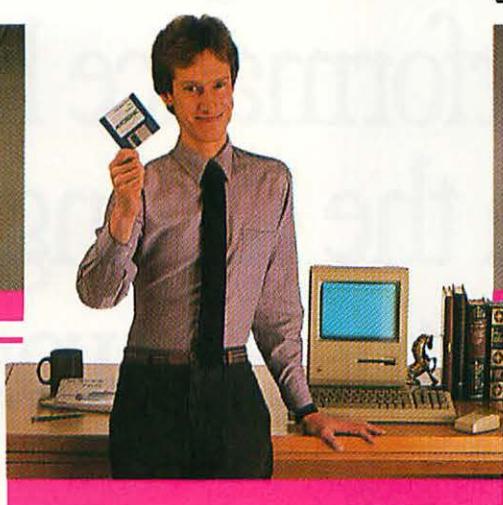
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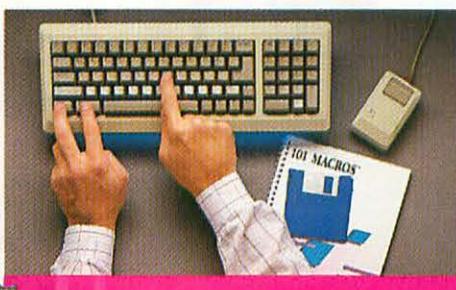
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Getting Started with Macintosh Graphics

Bit maps and objects, rasters and pixels, and a gallery of graphics applications.

by Jim Heid

I have two left hands when it comes to drawing. Give me a pencil, and I'll give you a picture with proportions and perspective that would cross Salvador Dali's eyes. I can barely draw a conclusion, much less a picture. A smart-aleck ex-friend commented that my drawings were so bad you needed dental records to identify their subjects.

My affliction is a common one: I know what I want to draw, but I can't convince my hand of it. Luckily, I exercise more control over a mouse than a pencil. That small measure of dexterity enables me to create images that are at least recognizable, thanks to the large stable of Macintosh graphics programs available. Whether you want to create expressionist abstractions, floor plans, three-dimensional technical illustrations, or graphs that flatter your bottom line, there's a graphics program to match the task. This month, I'll spotlight some of them while filling you in on how graphics work on the Mac. "Dots and Beams" explains how an image appears on the Mac's screen.

A Bit of MacPaint

Perhaps the most common Mac drawing medium is a *bit-map* drawing program like Apple's *MacPaint*. Most every Mac user has dipped into *MacPaint*'s bucket, using the *tool palette* to choose between such drawing implements as a pencil, paintbrush, or spray can.

To understand how bit-map drawing gets its name, imagine a sheet of graph paper with 612 boxes from left to right, and 792 boxes from top to bottom. To draw on this sheet of paper, you must form images by blackening individual boxes formed by



the intersecting lines. To erase a mistake, you turn black boxes into white ones as needed. To change the size of an object such as a circle or a line, you must laboriously erase and redraw black boxes.

With *MacPaint*, each "box" is a bit in the Mac's memory. When you blacken a box, you store a binary *one* in the memory box that corresponds to that spot on the page, and a *picture element*, or *pixel*, goes on the screen. Areas that appear white in a drawing contain zeros in their storage slots. The entire drawing, then, is a series (or a *map*) of bits, some containing a one,

others, a zero. What about gray areas or patterns? The Mac simulates them using combinations of black and white dots, a process called *dithering*.

This method of representing drawings as a series of ones and zeros gives bit-map drawing programs some drawbacks. Once you draw a shape or create some text using the text tool, the shape or text becomes a series of bits in the electronic graph paper formed by the Mac's memory. As with the

(continues)



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How To/Getting Started

Dots and Beams

If you look closely at a Mac's screen, you'll notice that its image is formed by small dots, or pixels—175,104 of them on a standard Mac display, to be specific. Each pixel has a corresponding slot reserved for it in a 22K chunk of the Mac's memory called the *screen buffer*. When a slot contains a value of zero, its pixel is off, or white. When a slot contains a one, its pixel is on, or black. Each slot represents one bit of memory. Since one bit is mapped to one pixel (as with *MacPaint*), the Mac's display is a bit-mapped one. That brings up an interesting point: whether you're using a bit-map program or an object-oriented one, the screen image you see is always bit-mapped.

The image itself is formed by a pinpoint beam of electrons crashing into the phosphor-coated back of the screen, causing it to glow. The beam, however, doesn't hit all the phos-

phor at once. An electric current flowing through a coil surrounding the picture tube's neck guides the beam so that it races back and forth, drawing 342 *scan lines* from top to bottom in about $\frac{1}{60}$ second. Of course, by the time the beam reaches the bottom of the screen, the glowing phosphor at the top is starting to fade, but you still see a full-screen image thanks to *persistence of vision*, the same mind game that makes movies appear to move.

A video display that creates a screen image using scan lines is called a *raster* display. (The term comes not from Jamaica, but from the Latin *raster*, meaning rake.) Laser printers work similarly, but instead of raking phosphor with an electron beam, they strafe a photosensitive drum with a pinpoint beam of light. The drum then attracts plastic powder that's transferred to paper.

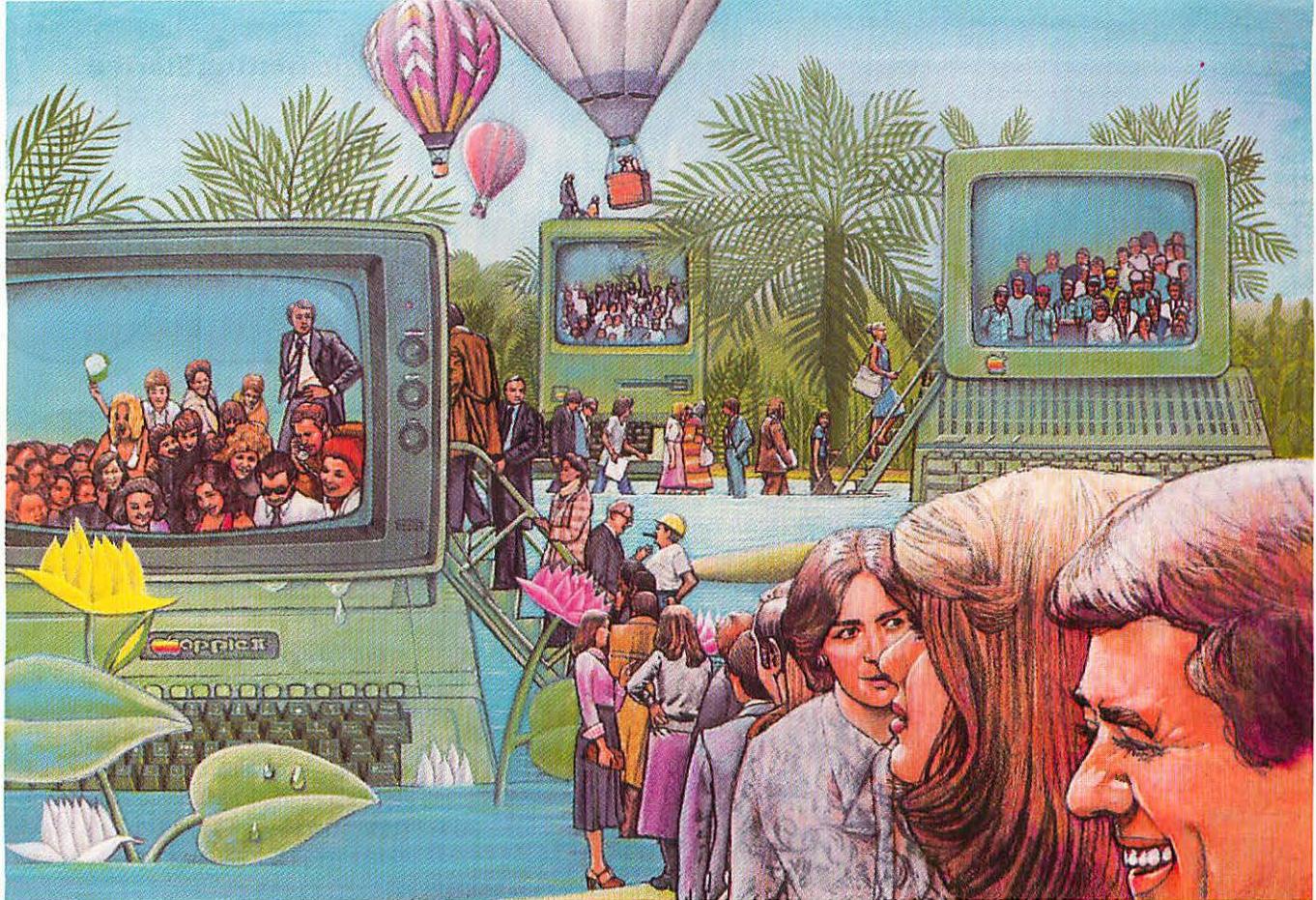
graph paper example, correcting a mistake or resizing a shape means erasing black dots and drawing new ones. That's a big limitation for text: instead of changing fonts or sizes or correcting a typo as you would with a word processor, you must retype part or all of the text.

Printing is another problem. Bit-mapped images have a resolution of roughly 72 dots per inch (dpi), which comes close to the ImageWriter's sharpness, but falls far short of a LaserWriter's 300-dpi capability. As a result, bit-mapped graphics look coarse when printed on a LaserWriter or any other printer that uses the PostScript page-description language. (You can improve their sharpness by using the Page Setup dialog box to print them at a reduced size; or you can use the Smoothing print option, which causes the LaserWriter print driver to "sand" some of the

rough edges, though it also slows down the printing). And because text in a bit-map program is treated as a picture, not as a combination of characters in a given font and size, *MacPaint* text doesn't have the typeset sharpness of a LaserWriter font.

The 72-dpi resolution of a bit-map image may come close to an ImageWriter's, but it's 8 dots shy of an exact match, and that causes distorted drawings when you print a document containing bit-map images. An ImageWriter in Faster or Best Quality prints roughly 80 horizontal dots per inch. The result: bit maps are compressed by about 13 percent—not a lot, but enough to turn a circle into an oval. The solution: selecting the Tall Adjusted option in the Page Setup dialog box. Tall Adjusted

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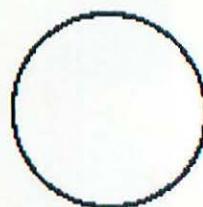
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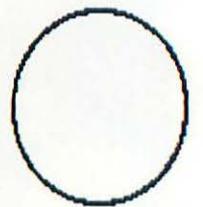


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Text



Text



A Tall Order

Because a bit map's 72-dpi resolution doesn't exactly match an ImageWriter's 80-dpi horizontal resolution, bit maps are condensed by approximately 13 percent. You can avoid the problem by using the Tall Adjusted option in the Page Setup dialog box, but that also causes text to be stretched with the graphic.

compensates for the difference in resolution, but at a price; text is widened along with the adjusted picture. A 5-inch column of text expands to over 5½ inches (see "A Tall Order"). This distortion occurs when you print a document from a program that uses the Mac's ImageWriter print driver. You won't encounter it when you print with *MacPaint*; its own printing routines compensate for the difference in resolution.

Apple used to include a copy of *MacPaint* with every Mac, a giveaway that didn't exactly provide a strong incentive for other software firms to improve on the program. With the debut of the Mac Plus, Apple started charging for *MacPaint*, and more potent programs soon appeared. Foremost among them are Ann Arbor Software's *FullPaint*, Mindscape's *GraphicWorks*, and Silicon Beach Software's *SuperPaint*. And for on-the-spot drawing, there's Hayden's *CheapPaint*, a desk accessory that crams a fairly complete drawing table into the Apple menu (see "MacPaint's Successors," *Macworld*, January 1987).

Most of *MacPaint*'s successors mimic its menus and palettes and satisfy many of the cravings of *MacPaint* veterans—scroll bars for accessing other parts of a document, full-page cutting and pasting, on-screen rulers, and the ability to have multi-

(continues)

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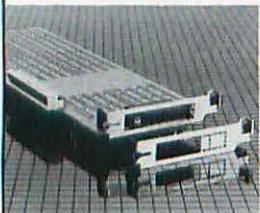
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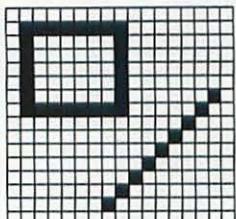
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How To/Getting Started



Bit-mapped graphic



Object-oriented graphic

= FrameRect(0,0,30,30)
Line(30,20)

QuickDraw commands

Bit Maps versus Objects

A bit-map drawing program like MacPaint treats text and graphics as a series of black squares in the bit map. An object-oriented program like MacDraw stores descriptions of the graphics. The graphic looks the same on screen, but the program stores it as a series of QuickDraw commands so you can alter object-oriented drawings more easily.

ple documents open simultaneously. Both 72-dpi barrier. *FullPaint* comes with a separate application that improves a picture's resolution on a laser printer, while *SuperPaint*'s LaserBits feature lets you boost a graphic's resolution to 150 or 300 dpi. *SuperPaint* and *GraphicWorks* can also use PostScript printer fonts and have a second tier of features for *object-oriented* drawing.

Artists who are more comfortable with charcoal and watercolor than with Fat Bits and pen patterns may find *GreyPaint* an ideal canvas. Created by Fractal Software and sold by Letraset, *GreyPaint* has tool palettes that include a finger for smearing portions of a drawing and a water droplet that blurs and softens to create a watercolor effect. You can customize the shape and drawing characteristics of most tools, including having them run out of paint—thus producing progressively lighter images—as you drag the mouse.

A Different Objective

Object-oriented graphics programs, the best-known of which is Apple's *MacDraw*, take a different route to producing pictures. Instead of reducing everything on the page to a series of bits, they treat each item as a separate object. Draw a circle, and the program makes notations in memory saying that you drew a circle with a radius of *a* at position *b*, with a border (or *pen*) width of *c* and a fill pattern of *d*. It's as if you created an image not by blackening squares on a piece of graph paper, but by laying down rubber bands shaped like lines, circles, or boxes. To resize an object, you simply stretch or compress it as needed, instead of erasing and redrawing.

The ability to alter the drawing without a lot of erasing is one big advantage of object-oriented programs. There are others, too. Object-oriented programs don't store images as bit maps, but as a series of commands for QuickDraw, the Mac's built-in set of graphics routines (see "Bit Map versus Objects"). Thus, their images aren't *resolution dependent*; they aren't tied to a specific number of dots per inch as are bit-mapped ones. A *MacDraw* graphic that appears on the screen at 72 dpi can print on a LaserWriter at 300 dpi and on a Linotronic 100 PostScript phototypesetter at 1270 dpi. And object-oriented programs store text as text, letting you exploit the sharpness and beauty of PostScript fonts.

Object-oriented programs also offer more precision, with on-screen rulers, adjustable grids that help you align items, and measuring features for creating drawings to scale. They also let you paste bit-mapped images into drawings and create drawings larger than a single 8½- by 11-inch page. In the latter case, the program prints the document by *tiling* pages—printing each page and overlapping the boundaries slightly so you can tape or paste them together.

Object-oriented drawing programs are geared to electronic drafting, but they also make serviceable layout tables for desktop publishing jobs that don't require complex text-slinging features like automatic hyphenation and the ability to flow text over numerous pages (see "Mac Pasteup Tools," *Macworld*, May 1987).

MacDraw isn't alone in its class. Imagine it on a weight-lifting regimen and you've got Innovative Data Design's *MacDraft*. Although it works much like *MacDraw*, *MacDraft* has more drawing muscle, including the ability to rotate objects in

one-degree increments and to label them with their dimensions (see "Drafting's New Compass," *Macworld*, January 1986).

The PostScript Link

If *MacDraft* is *MacDraw* with muscle, then Cricket Software's *Cricket Draw* is *MacDraw* on steroids. *Cricket Draw* builds on the foundation of *MacDraw* and *MacDraft* and is also "PostScript-aware," designed to let you tap PostScript's powerful text- and graphics-handling talents, such as the ability to rotate and shade text and graphics. (See "Rounding the Bezier Curve," *Macworld*, May 1987.)

Even more interesting is *Cricket Draw*'s ability to create a file containing the PostScript program commands that describe a drawing. Those resulting statements are more than just a peek into PostScript's workings. You can save them in a special format called *Encapsulated PostScript*, or EPS, and use them with applications that support EPS, such as version 2.0 of Aldus's *PageMaker*. That means you can produce a special effect, such as shadowed text hugging the contour of an image, and plug it into a publication as its logo.

The ultimate in PostScript power, however, may be *Illustrator*, from PostScript's creators, Adobe Systems. *Illustrator* is aptly named: it's intended for producing detailed drawings and technical illustrations (see "Illustrator: The Tracer's Edge," *Macworld*, June 1987). You first paste or scan in a bit-mapped drawing, then trace it with *Illustrator*'s drawing tools. *Illustrator* turns your tracings into PostScript code, which you can print or save in *Illustrator*, PICT, or EPS format. *Illustrator* also has many of *Cricket Draw*'s text-altering capabilities, although they're more for annotating drawings than for publication layout.

The Third Dimension

Perhaps the most fascinating graphics programs to tinker with are ones that produce three-dimensional images—or, more accurately, simulate them on the screen through perspective and shading.

For someone used to the click-the-tool-and-go ease of most Mac drawing programs, a 3-D program is a foreign land with its own language (see "3-D, Take 2," *Macworld*, May 1987). Creating a 3-D image usually involves combining primitives—basic shapes like cubes, cones, and spheres—with shapes you draw. But the operating styles of different 3-D programs vary enough to make generalizing difficult.

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Programs like Challenger Software's *Mac3D* and *Phoenix 3D* from Dreams of the Phoenix provide some *MacDraw*-like tools for creating custom shapes. Others provide drawing tools unique to the 3-D world. Enabling Technologies' *Pro3D* has a Lathe tool that produces *radially symmetrical* objects like candlesticks or baseball bats, and a Profiler tool that lets you laminate outlines together to produce complex shapes like houses or cars. Creating a complete 3-D scene usually means drawing separate shapes with these tools, then merging them.

After building a scene, you can rotate it, look down on it or up at it, and change the "lighting" (alter the position and intensity of one or more light sources.) Your vantage point is called the *camera view*; many programs let you examine your scene from several views at once. You can print drawings on an ImageWriter or a LaserWriter, with the latter producing dramatic shading effects. *Mac3D* and Abvent's *SpaceEdit* also support *plotters*, printing devices that output drawings by zipping special felt-tipped pens across the paper.

Some Mac 3-D programs are quite powerful, but don't picture yourself like a lab-coated technician in a tire commercial,

watching your designs spinning on screen. With the number crunching required to calculate perspective and shading, the Mac isn't fast enough to animate three-dimensional scenes as a computer-aided design workstation can. The Mac II, however, has animation potential. With its 68881 *numeric coprocessor*, a chip that takes over calculations from the 68020, the Mac II may earn a role in tomorrow's tire commercials.

If you don't have a Mac II but do have patience, you can animate three-dimensional drawings by copying different views of a scene into an animation program like *VideoWorks* or *MacMovies*. Some serious 3-D animators combine a 3-D program and *VideoWorks* with Apple's *Switcher*, and use Affinity Microsystem's *Tempo* to automate the rotate, copy, and paste process.

Picto Graphs

Future archaeologists may be unable to decipher our written languages, but at least they'll have pie charts to show where our tax dollars went. Charts and graphs from business graphics programs like Microsoft's *Excel* and *Chart*, Cricket Software's *Cricket Graph*, and Lotus's *Jazz* have become the hieroglyphics of our time. Printed as is or spruced up in a draw-

ing program, they provide at-a-glance insights into tables of yawn-worthy numbers. (See the September 1985 *Macworld* for reviews of *Jazz* and *Excel*, and "The Kingpin of Presentation Graphics," *Macworld*, July 1986, for a review of *Cricket Graph*.)

Charting programs require data in tabular form, which is one reason why they're often paired with spreadsheets. The combo works well: you can select a row of data (perhaps final sales figures for the past four quarters), choose a command or two, and the program creates a chart. Each value is a *data point*; a set of values is a *data series*. The column headings act as *category names*, which, in a bar chart, appear below their corresponding bars.

You can create additional data series—perhaps to contrast this year's sales figures with last year's—by using more than one row of values. In such cases you'll probably add a *legend*, a box near the chart that shows which pattern depicts each data series.

Combination Platters

Graphics play such a big role in the Mac environment that drawing features are popping up in all kinds of applications—in

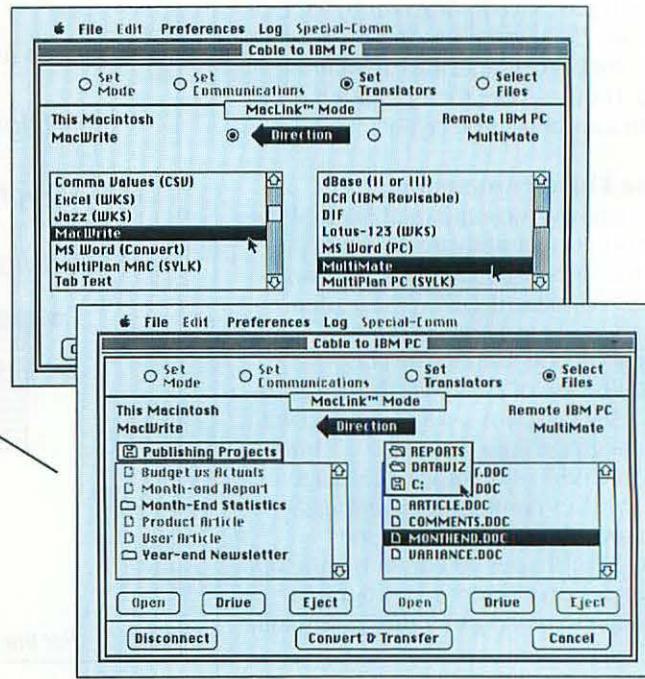
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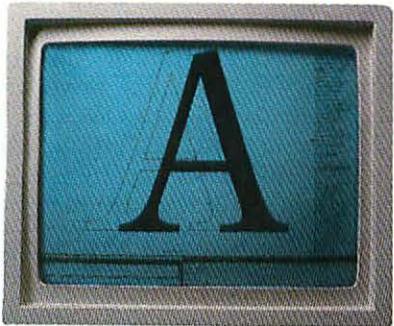
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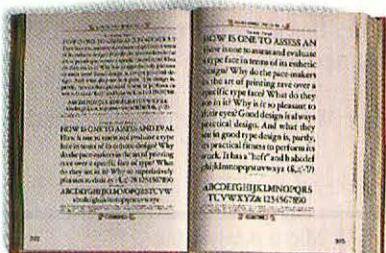


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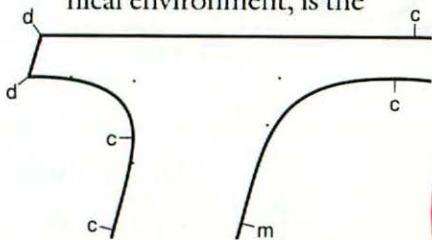
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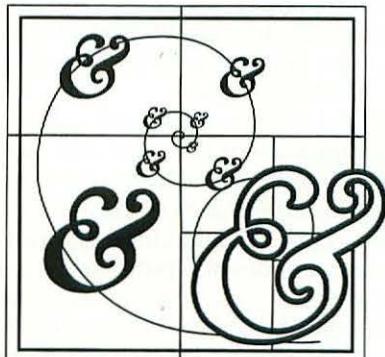


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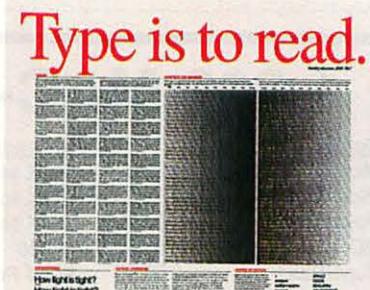
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word processors like Ann Arbor Softworks' *FullWrite Professional*, which has built-in object-oriented drawing; in spreadsheets like Data Tailor's *Trapeze*, which has business graphics features (see *Reviews, Macworld*, May 1987); in integrated packages like *Jazz* and *Microsoft Works*, which offer business graphics; even in a telecommunications program, Hayes's *Smartcom II*, whose bit-map drawing window lets you interactively draw over the phone with another *Smartcom II* user.

Then there are the "identity crisis programs"—applications that, with a kitchen-sink mix of features, defy categorization. Target Software's *Scoop* combines bit-map drawing, object-oriented drawing, word processing, and desktop publishing. Laserware's *LaserPrint* integrates bit-map and object-oriented drawing with desktop publishing. Forethought's *PowerPoint* merges object-oriented drawing with a novel form of desktop publishing that lets you create graphics for overhead transparencies, flipcharts, and slide presentations.

Moving Pictures

Since graphics is the common denominator in so many Mac applications, it's a good thing we have several ways to move images between programs. The most basic

are the Mac Clipboard, which lets you cut, copy, and paste graphics and text between applications, and the Scrapbook, a desk accessory that lets you store on disk any number of pages of text or graphics pasted from the Clipboard for subsequent copying and pasting into other applications. Beyond these basics, a popular file format called *PICT* stores object-oriented graphics in the form of commands for QuickDraw, the internal routines that give the Mac its graphics talents. Many programs, including *MacDraw*, *GraphicWorks*, and *Cricket Draw* have a *PICT* option in their Save As dialog boxes, and most desktop publishing programs can open and place *PICT* files.

And then there's the *EPS* format I mentioned earlier. It's worth adding that an *EPS* file can also contain a *PICT* representation of the *EPS* file's graphic. When you bring a *PICT*-equipped *EPS* file into a program, the *PICT* portion can be used to show an on-screen approximation of the effect produced by the *EPS* file. Finally, an up-and-coming file structure is the *tagged image file format*, or *TIFF*. Hammered out by several scanner manufacturers to represent the images their wares produce, the *TIFF* standard is supported by *Graphic-*

Works, *PageMaker 2.0*, *The Realist*, and many IBM PC graphics and publishing programs.

Speaking of scanners, don't overlook them as a way of getting artwork into the computer (see "Hands-On Digitizing," *Macworld*, March 1987). They require an investment in cash and setup time, but they're certainly the best graphics solution for the drawing-impaired. Another alternative may be a *graphics tablet*, a device the size of a cook's cutting board, with a pencil-like stylus that replaces the mouse as the means of motion for the Mac's pointer (see *Reviews, Macworld*, March 1987). Artists find drawing with a graphics tablet's stylus more natural than with a mouse. Tracing existing art is easier, too.

Finally, if you just need a simple illustration to complement some text in a publication or advertisement, consider a library of *clip art*—ready-to-paste drawings on disk (see "Art to Go," *Macworld*, December 1986). Clip art tends to be the Muzak of the art world, but a well-done canned illustration beats a lousy custom one. If you can't draw yourself, draw on someone else. □

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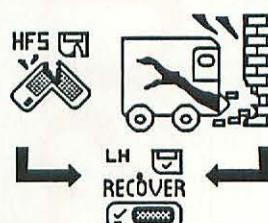
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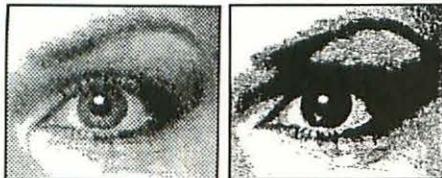
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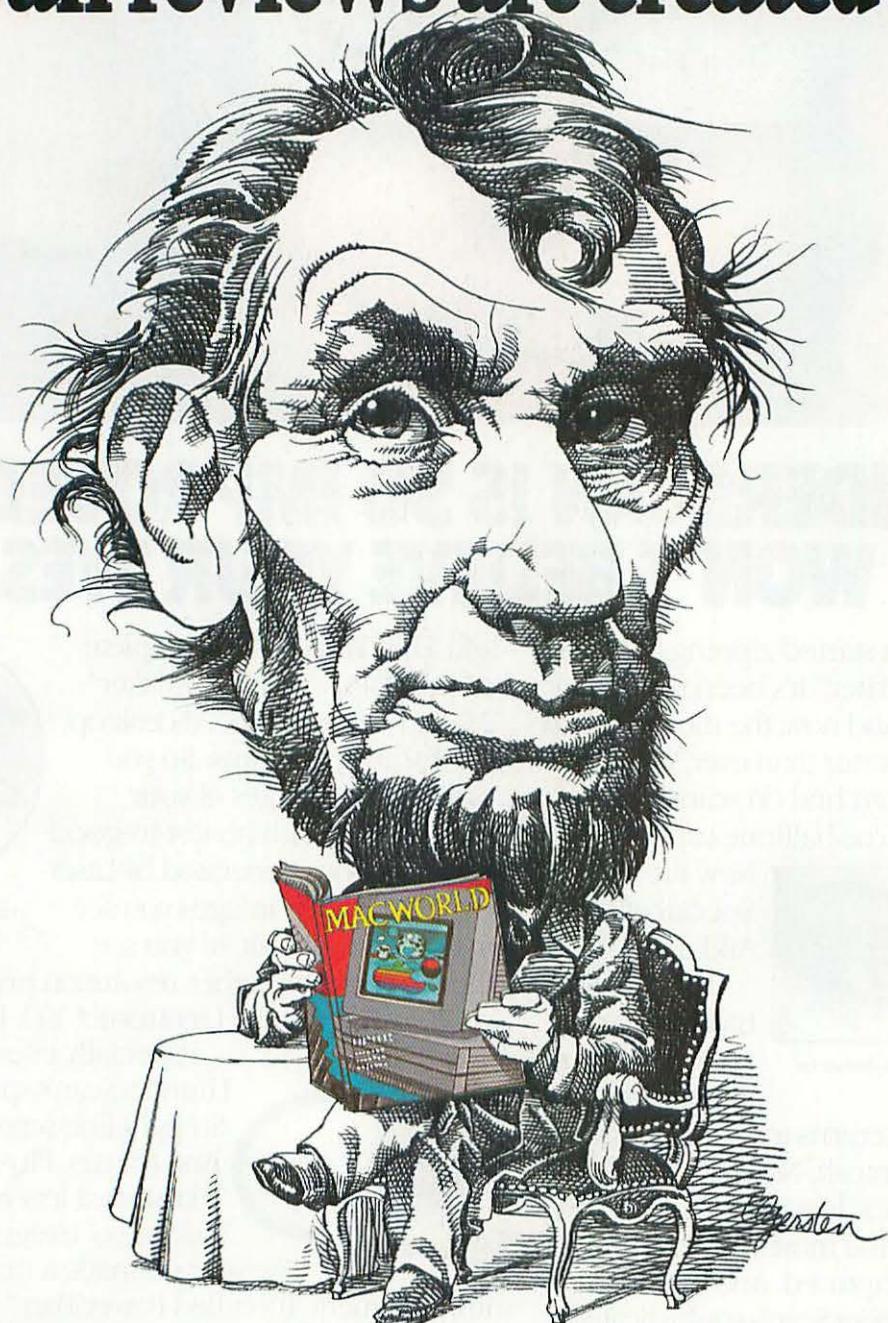
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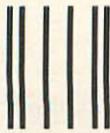
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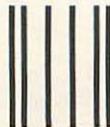
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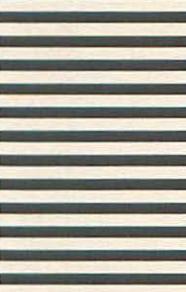
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Insights on More

Getting More work done

by Robert C. Eckhardt

Without doubt, the current standard-bearer for idea processor/outliner programs is *More* by Living Videotext. While it's capable of high-quality printed output in text or graphic formats, *More* is not simply an outliner. People put it to work as a presentation program for computer-enhanced meetings, as a time manager and calendar, as an electronic phone book and dialer, or as a simple database.

Because *More* is so full of features, the manual overlooks a few entirely and fails to fully describe the usefulness of some others. Still others are treated with such modesty that one could easily miss their significance. For those who have yet to take full advantage of what *More* (version 1.1) has to offer, here are some useful tips. Even those who think they know *More* inside out will, I hope, discover a few new and useful techniques.

My thanks to Kandes Bregman and Robin Foster at Living Videotext, Bernard DeKoven of Computer-Enhanced Meetings, Marc Gerstein of Delta Consulting Group, and the participants in the IVT Forum on CompuServe for their contributions.

Upgrade to the Latest Version

The original release of *More* (version 1.0) had a number of shortcomings, including the absence of an Undo command, the inability to display more than one headline level in bullet charts, and inflexible font styling. Fortunately, these and other problems have been fixed in version 1.1, the current release. If you bought version 1.0 and did not receive the free update, it's probably because you forgot to send in your registration card. To get a copy of the new version, send in your registration card along with a note stating that you need a 1.1 update package.

Two Windows, One Outline

If you have a long outline and want to work on one part while referring to another, open a second copy of the same out-



LISA OSTA

line and arrange the two windows so you can see the contents of both at once. Do all your editing in only one window, though, to avoid confusion.

Dialog Boxes

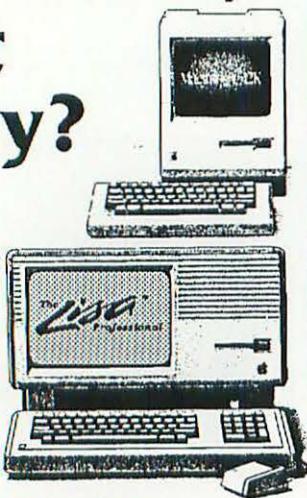
If you prefer keeping your hands on the keyboard, try these shortcuts that avoid mousing around. To select a button in a simple dialog box (that is, one without text entry blanks) from the keyboard, press the

key corresponding to the first letter of a button's name. For example, instead of clicking the OK button, press the O key. In file-selection dialog boxes, pressing the initial of a file name scrolls the list to files beginning with that letter; use ⌘ -letter key combinations to select drives, such as $\text{⌘}-D$ to change drives. In dialog boxes with

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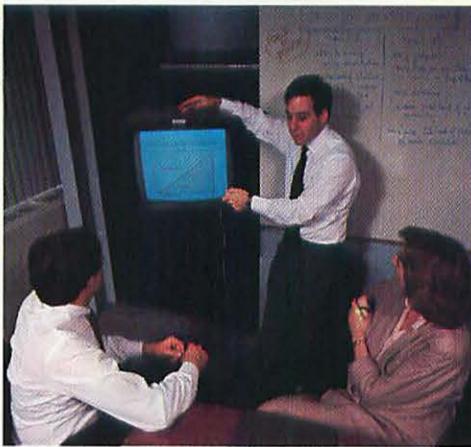
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How To/Insights

JOYCE RAYID



During meetings Marc Gerstein uses the mouse to advance More screens as if they were slides.

text entry fields, again use **⌘-letter** key combinations to select buttons, and move from one text entry area to the next by pressing the Tab key (to move to the next field) or Shift-Tab (to go in reverse).

Tabs in Headlines

Some people even make tables with *More*. It takes a little thinking, though, because the Tab key is equivalent to **⌘-R**; they both move a headline to the right. If you press Option-Tab, however, a real tab will be entered into the selected headline at the insertion point.

A Fitting Check

When running *More* with *Switcher*, or in any situation where memory is in short supply, use the About *More* command on the Apple menu to find out how much free RAM is available and to determine how large (in K) your current outlines are.

Sorting by Time and Date

To sort headlines by time and/or date, you must put the time or date, in the correct format, at the beginning of the headline. The easiest way to enter times and dates is to use the time and date stamps in the Edit menu. To set the correct format, select the Time & Date command in the Format menu. For the time stamp, select 24-Hour Clock and Leading Zeros on Hours. For the date stamp, select Numeric, Y/M/D, Leading Zeros on Day and Month, and Include Century.

Decloning

To change a clone headline back to a standard headline, cut it to the Clipboard and then paste it back to its original position.

Stripping Leading Characters

When you transfer headlines into a document window from a template or by using the Paste or Receive From commands, leading characters (such as the + and - signs) usually precede each headline. To remove the characters during the transfer, hold down the Option key while you choose the desired transfer command.

Calculations and Calendars

More interprets any number with an embedded slash (/) as a date and any number containing a semicolon (;) as a time. So to hide irrelevant figures while calculating sums, temporarily insert either a slash or a semicolon in the numbers you do not want included in the calculation.

Date-only Calendars

When using the Calendar command, you don't have to delete appointment-hour subheadlines by hand to create an outline calendar comprising only days, weeks, and months. Instead, before clicking on the Make Calendar Outline button, put the same hour in the From and To boxes in the Time section of the Calendar command window.

Counting Headlines

To count the number of headlines and documents in an outline, select the summit (topmost) headline and enter **?** in the Search For blank in the Search dialog box. Turn on Match Pattern in the Search dialog box and click the Find All button. If you want a count for only a section of the outline, select the appropriate headline and click on Barcursor Only in the Search dialog box. To count a single document window, place the cursor before the first word of a full-screen document window before initiating the search.

More Counting

To count the number of correctly punctuated sentences in an outline or segment of an outline, enter **[.!,?]** in the Search For field of the Search dialog box, turn on Match Pattern, and click Find All. You can limit the search as you do when counting headlines.

Similarly, to count words (three letters or more), choose a section of the outline, making sure the text insertion bar is at the

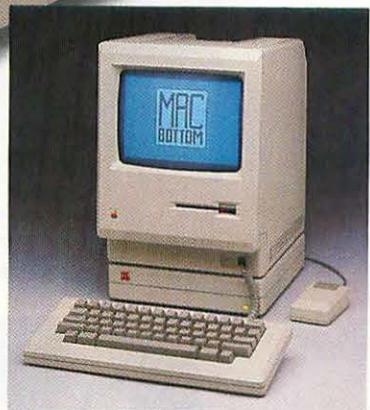
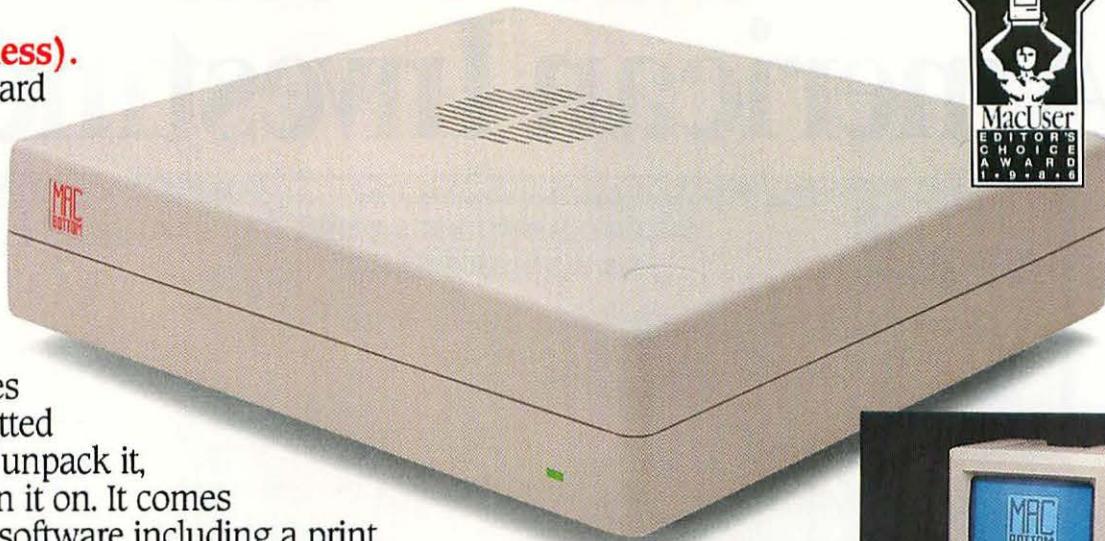
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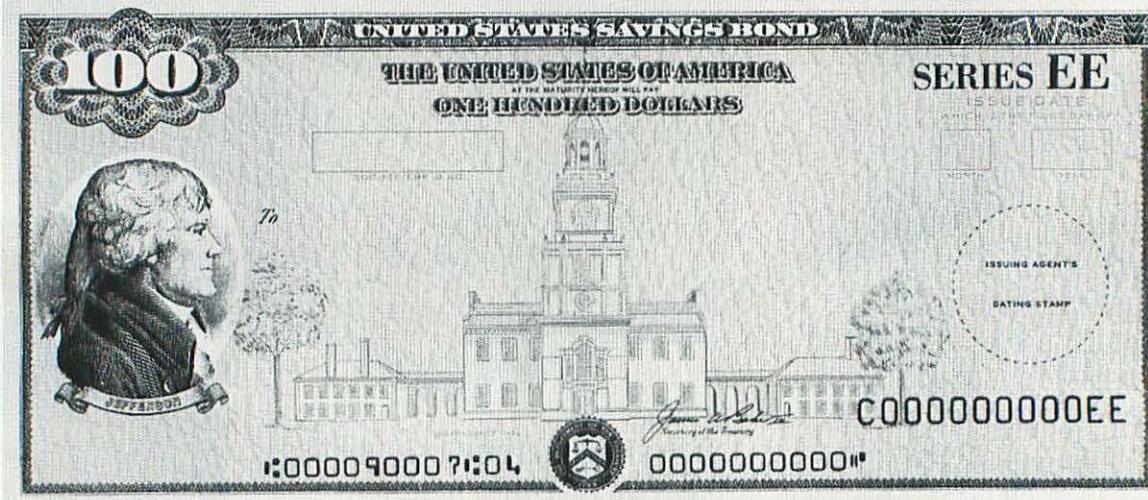
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beginning of the selected headline. Select the Search command, enter [a-z][a-z][a-z][a-z]* in the Search For blank, turn on Match Pattern and turn off Match Case, and click Find All. To count characters, enter ? in the Search For blank, turn on Match Pattern, and click Find All.

Making Major Changes

More's search and replace functions limit you to 127 characters in the Change To blank of the Search dialog box. To replace designated text strings with longer pieces of text, copy the replacement text to the Clipboard. Then use the Find Next command (or ⌘-F) and Paste commands to insert the substitute text from the Clipboard. Since the Clipboard can store font styles (the Change To box does not), this is also a way to change text to a different style.

Address Lists Made Easier

Say you've used the address file template on the Template menu to make a comprehensive list of your contacts. When you mark and gather a list of phone numbers, you find yourself with a bunch of numbers and no names. This is because both mark-

ing and gathering work only on single headlines (the one with the phone number, for example) and ignore neighboring headlines (such as the one with the name), even though they may contain important information. To solve this problem, when an address entry is complete, copy it to the Clipboard, paste it to the document window of the entry's main headline, and then delete all the subheadlines. Then when you mark and gather, you'll get the entire contents of the document window.

Centering Bullet Charts

To center bullet charts on a printed page with the page number at the bottom, be sure to turn on the As Shown When Printed button in the Bullet Options command window (accessed via the Formats menu). If you leave the Normal For Screen button selected instead, the charts will print off-center (both vertically and horizontally), with the page number directly below the chart.

Long Lists on Screen

When you're preparing bullet charts for on-screen presentations, select As Shown When Printed from the Bullet Op-

tions window to display a bullet chart that fills the screen. Be careful that your charts are not too long, however. In this viewing mode, charts that are too long for the screen are simply truncated; the missing part of the chart is not continued on the next screen.

Large Graphics on Screen

To display the largest possible graphic image in a bullet chart, select Normal For Screen from the Bullet Options window.

Cliff-hanger Charts

A particularly effective type of bullet chart slide show is one that adds a new line to a list each time you click the mouse. To create such a sequence, first draw up the complete list in outline form as it will appear on the last slide—a main headline and a series of subheadlines. The effect works best if you preserve the illusion that you're adding to a list as you develop your theme, rather than showing a bunch of different images.

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text. If you prefer not to add more text, pad the main headline with invisible Option-spaces (nonbreaking spaces). Now make one duplicate of the list for each sub-headline. Starting with the final copy of the series, remove the bottom one, then two, then three subheadlines, and so on up the duplicates until you reach the opening list, which should have no subheadlines. Finally, change to Bullet Chart view and choose As Shown When Printed from the Bullet Options dialog box so that the charts all start in the same position at the top of the page.

And Serial Graphics

A similarly effective bullet-chart slide show consists of the sequential construction or alteration of a graphic image (such as a diagram or a bar chart). The easiest way to create this series of bullet charts is to first construct the final image in *MacDraw*. (If you use *Cricket Draw*, be careful not to use any PostScript effects—they won't transfer to *More*.) To keep the illustrations from changing position on the screen in *More*, surround the image with a box in *MacDraw*. Select a white line for

the box if you don't want a visible frame. Using *Switcher*, copy and paste the complete *MacDraw* image into the document window of the last headline in the *More* outline.

Back in *MacDraw*, strip away (or deselect) an element of the illustration, then revise and copy the image again and paste it to the headline above the previous one. Continue in this way until you paste the most basic version of the image to the top-most headline. Finally, select Bullet Chart view and start your slide show. Each chart in the sequence will overlay the previous one exactly, so it will appear as if you're unveiling previously hidden parts of a single slide.

Bullet Charts within Outlines

Sometimes you may want to print bullet charts within a regular outline. You can do so by putting the bullet chart in a graphics window. First display the bullet chart the way you want it, then cut or copy it to the Clipboard. Select the headline under which you want the bullet chart to appear and select Paste. Finally, print the document with the Pictures To Level option in the Print Options window set to the appro-

priate level. For example, if you have bullet charts attached to level 3 headlines, you must set Pictures To Level 3 or greater.

Exporting Bullet Charts

You can also transfer a sequence of bullet charts to draw programs, such as *MacDraw* and *Cricket Draw*. Simply display them as bullet charts and customize them; then use the Export command with *MacDraw* format to create a PICT (generic draw) file.

To transfer a single bullet chart to *PageMaker*, *ReadySetGo 3.0*, *SuperPaint*, or another program that accepts graphics, copy the individual chart on the screen to the Clipboard and then paste it into the other program. Programs that handle PICT images receive the chart in PICT format; those that work only with bit maps receive a bit-mapped image. Charts that are clipped by the bottom of the screen when the As Shown When Printed option is turned on are transferred in their entirety via the Clipboard.

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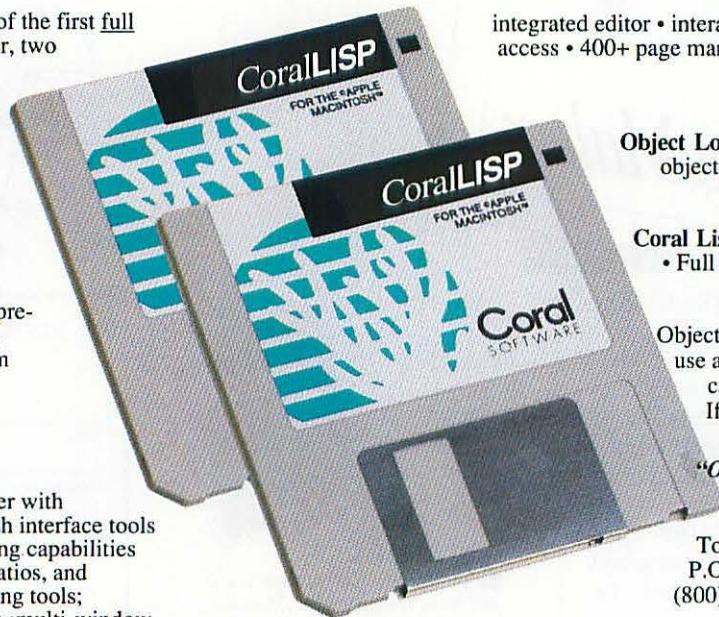
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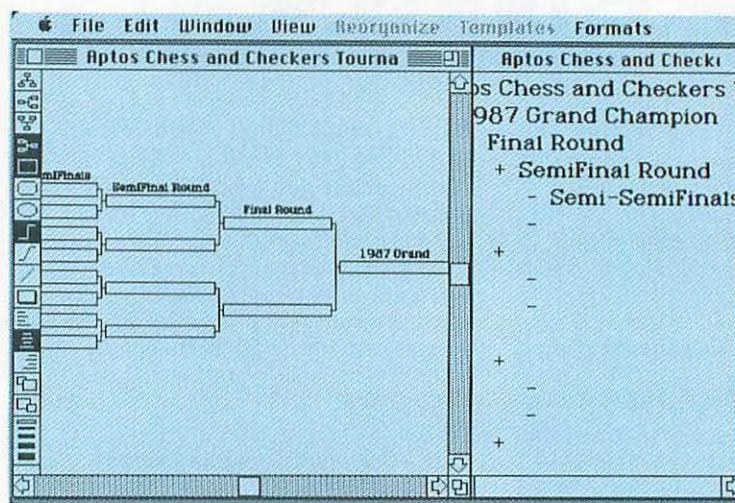
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How To/Insights



Game Charts

In More you can open two views of the same outline at once. Here, a tournament-style outline is displayed in both tree-chart and outline views.

Tree Charts in Outlines

You can print tree charts within a regular outline or display them in a bullet chart (if you want to give your tree charts titles, for example) by putting them in graphics windows. To do so, first display the tree chart exactly as you want it to appear. If you intend to use the chart in a bullet-chart slide show, be sure it's small enough. If you intend to print it as part of an outline, fit the chart within the margins set for the outline. Copy the chart to the Clipboard. Finally, move the bar cursor to the headline under which you want the chart to appear and select the Paste command to place the chart in the headline's document window.

Labeled Tree-Chart Boxes

It's easy to put labels above empty tree-chart boxes. Choose a large font size together with a box size too small for the font. *More* prints the text—which would ordinarily appear inside the box—on top of the box instead. For a tournament-style chart, for example, add empty headlines to the outline to create columns of empty boxes beneath the one with the title (see "Game Charts").

Naked Tree Charts

To create tree charts with text only, and no connecting lines or boxes, choose the white-line pattern in the Tree Options dialog box.

Exporting Tree Charts

You can transfer multiple-page charts to draw programs like *MacDraw* and *Cricket Draw*. While in tree-chart view,

use the *MacDraw* format option of the Export command to create a PICT file.

To transfer a single-page chart to *PageMaker*, *ReadySetGo*, *SuperPaint*, *FullPaint*, or another application that accepts graphics, copy and paste the chart via the Clipboard. Just as with the bullet charts, the program tree chart transfers either in PICT format or as a bit map.

You can use the Clipboard to transfer multiple-page tree charts to programs that accept only single-page graphics. First, shrink the tree chart to fit on a single page (this usually requires some experimentation). Contrary to statements in the *More* manual, tree-chart segments that extend beyond the screen's boundaries do transfer properly via the Clipboard—as long as the whole chart can be accommodated on a single page.

Centering Titles

Unfortunately, *More* cannot center the summit headline on the page to serve as a title. You can achieve the same effect, however. First, place the bar cursor on the summit headline and press Return to add a new headline beneath it. Then type the desired title in the new headline and choose the Demote command from the Reorganize menu with the new headline still selected. Select Print Options on the Formats menu and enter 1 in the Center To Level box. Finally, in the Print dialog box, turn off the Include Summit option and click on OK to print.

Previewing Printed Outlines

Although you can use the Expand To command in the View menu to get a general idea of what your outline will look like

(continues)

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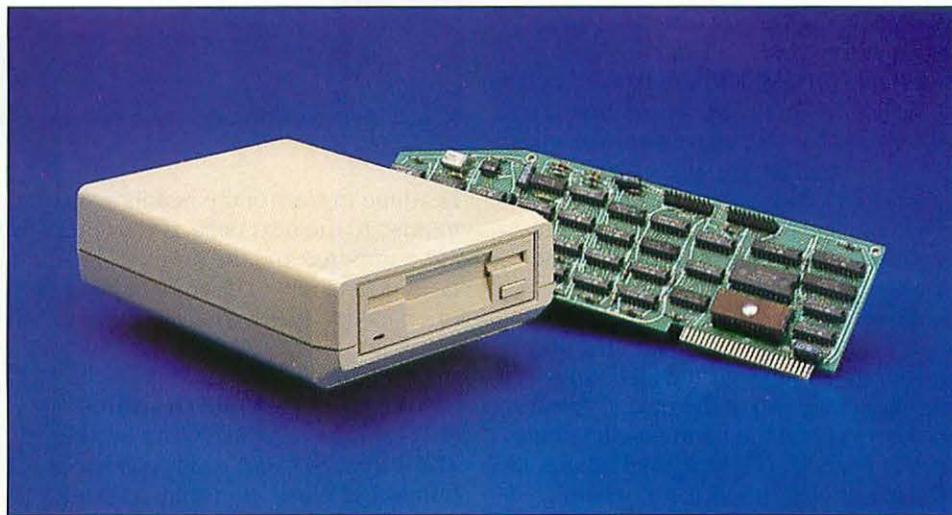
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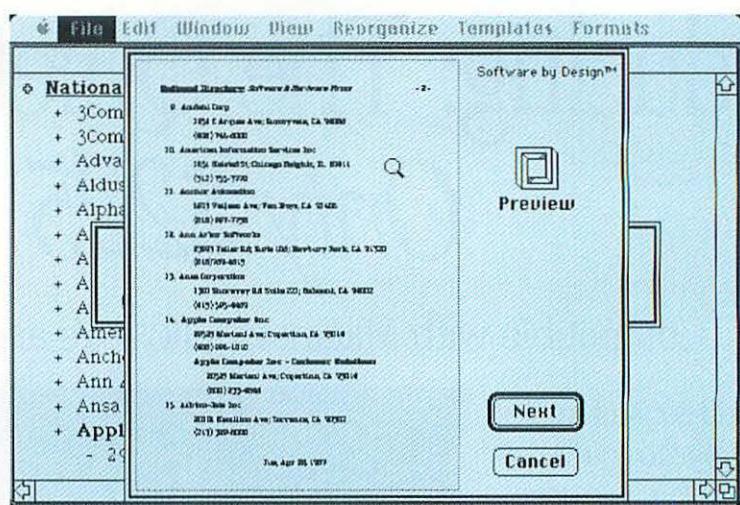
MW

when printed, *More* doesn't show page breaks, the final position of graphics documents, or headers and footers. You can get a precise picture of what your outline will look like when printed using Randy Ubilllos's shareware program *Preview*, version 1.3 (see "Page Preview").

To use *Preview*, put a copy of the program in your System Folder. Start *More* and, with the Chooser, select *Preview* instead of your usual printer driver. Any time you want to see how your outline will look when printed, select the Print command and click on OK in the Print dialog box. *Preview* then displays what the printer would have printed. You can flip through the pages of a multiple-page document and zoom in to a life-size view of critical areas. To print the outline, be sure to reselect the printer driver with the Chooser. *Preview* works with any program that lacks a precise what-you-see-is-what-you-get view.

Forcing Page Breaks

If *Preview* reveals a major headline at the bottom of one page and all its sub-headlines at the top of the next, there are two ways to force the main headline onto the next page. If your headlines are not labeled in any way, simply insert a blank



headline in front of the headline you want to push to the next page. If your headlines are numbered and the previous headline does not yet have a document window, open its document window and insert a blank line.

Pasting Multiple Graphics

Owners of *More*'s older brother, *ThinkTank 512*, can easily paste a large number of illustrations into an outline. First, put all the images in the Scrapbook.

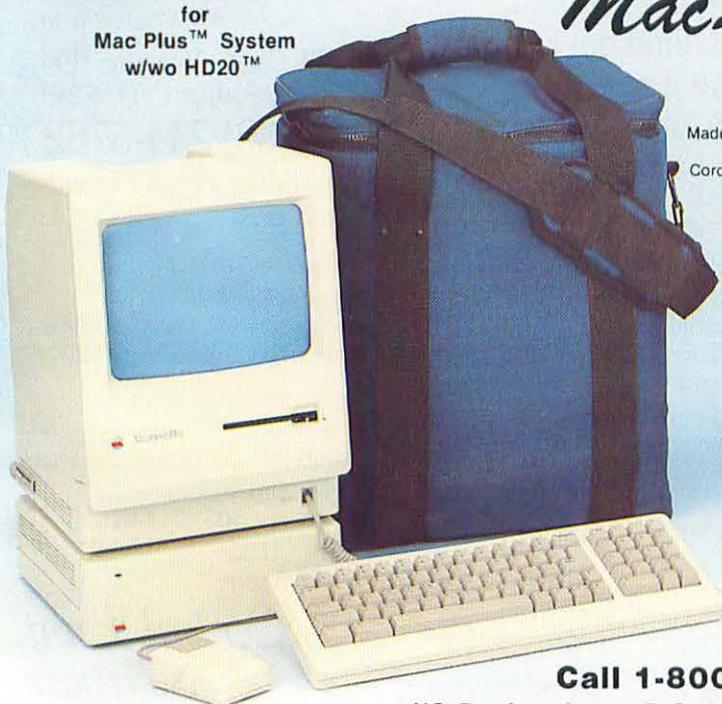
Page Preview

Preview, a shareware program, displays on screen what your outline will look like on paper. Click the magnifier tool for an actual-size view of the area underneath; click again to return to a full-page approximation.

Then open *ThinkTank*, open a new document, and select Paste From Scrapbook in the Edit menu. The resulting outline is a series of blank headlines, each with a Scrapbook illustration stored as a graphic document. Save the outline, quit *ThinkTank*, open *More*, and then open the outline you just created with *ThinkTank* to finish the job. □

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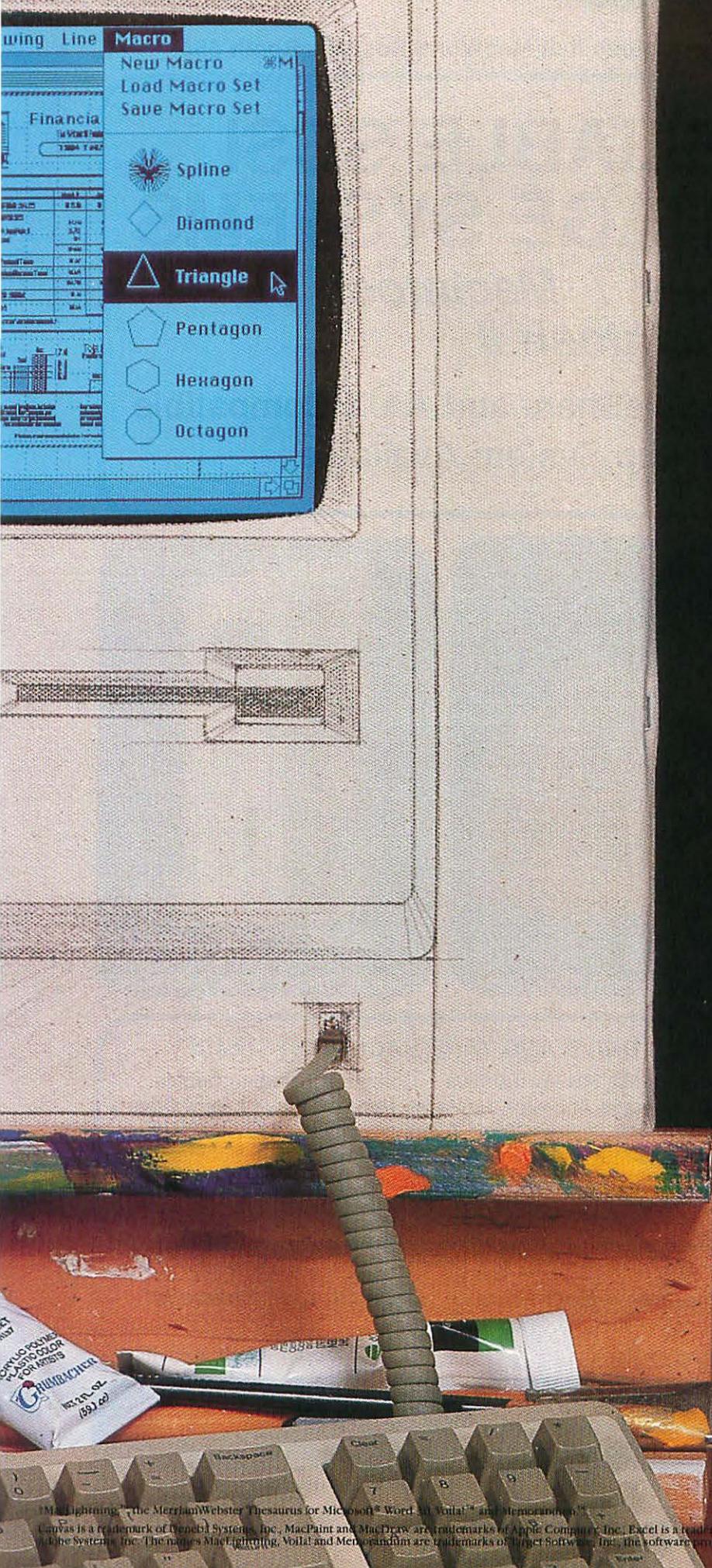
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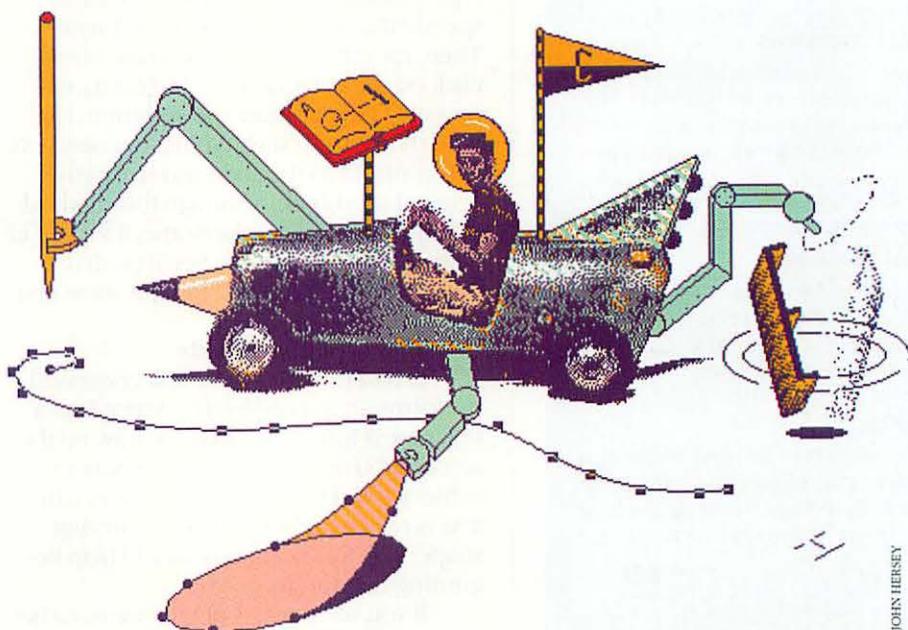
Mac Graphics Tools

Shedding light on Cricket Draw's undocumented features for PostScript graphics

by Erfert Nielson

New concepts often take a little time to catch on, but a proper introduction can make a difference. *Cricket Draw* represents a new technology, in this case PostScript graphics. For a variety of reasons, many users are puzzled about aspects of the program. Some are confused about the nature of PostScript graphics and the relationship of *Cricket Draw* to other Macintosh programs. The manual, too, leaves room for some questions. Although it's an excellent introduction to the basics of *Cricket Draw*, the documentation was written early in the program's development and fails to mention numerous features that were added or discovered after the program was released. In addition, word of mouth about bugs in the original version 1.0—which caused inconveniences from printing problems to program crashes—still leave some people reluctant to use the now updated *Cricket Draw*. The following tips should help *Cricket Draw* artists better understand the program, as well as avoid some of its shortcomings.

Briefly, *Cricket Draw* is a graphics program that lets nonprogrammers create special effects with the PostScript page-description language. Such effects include slanting or rotating text or graphics, filling objects with smooth transitions from one shade of gray to another, and attaching text to a path. (For a more detailed look at *Cricket Draw*'s features, see "Rounding the Bezier Curve," *Macworld*, May 1987.) The program's icon-based interface allows PostScript illiterates like me to produce impressive effects by manipulating graphic objects on the screen. To display text at an angle, for example, you click an icon, grab a corner of the text block, and rotate it. For those who are familiar with it, the PostScript code associated with each drawing is available for viewing and editing.



JOHN HERSEY

A *Cricket Draw* illustration can be printed directly from *Cricket Draw* or saved as a PICT file, transferred to another program, and printed from that program. But here some problems begin to surface. Probably the most common complaint about *Cricket Draw* is that it doesn't work with *PageMaker* 1.2. Although this fact is acknowledged in *Cricket Draw*'s manual, the information is tucked away in an appendix, where it can easily be overlooked. *PageMaker* 2.0 does accept and print PICT files created with *Cricket Draw*. The appendix also mentions that *MacDraw* may have problems reading PICT files created in *Cricket Draw*. A *Cricket Draw* PICT file includes PostScript code necessary for printing the file; *MacDraw*, which was written before the days of embedded PostScript commands, interprets the commands as text—and displays and prints them as such. According to a *Cricket Software* representative, *Cricket Draw* PICT

files are designed primarily to be exported to page-layout programs. *Cricket Draw* illustrations can also be pasted into word processing programs, although problems sometimes crop up with this technique. Caveat exporter.

The following tips came from *Cricket Draw* users and from *Cricket Software*'s technical support staff. Desktop publishers Brian Lawler and Kevin Rardin were especially helpful, as was Doug Seward of *Cricket Software*.

You'll find more tips in *Cricket's Technical Notes*, which are released every few months (notes were included with *Cricket Draw* 1.0 and 1.01). For \$25 you can get an annual subscription to the notes; in addition, *Cricket* plans to make them available on several online information services.

(continues)

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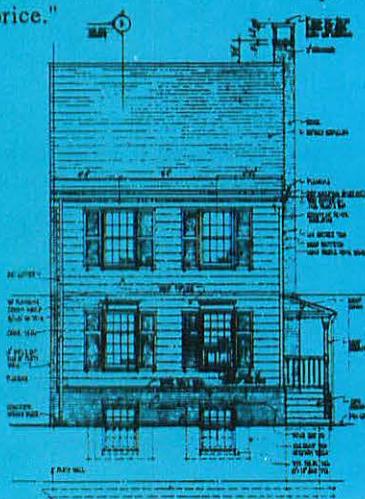
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How To/Mac Tools

Quick and Dirty Default Text

One of *Cricket Draw*'s strengths is its ability to display text in a variety of fonts, styles, sizes, shades, and orientations. But one of the program's weaknesses is its inability to reset the default font size and style; when you click on the text icon and start typing, 12-point Helvetica always appears. If you want to type numerous labels in, say, 10-point Times, you must choose the Set Type command for each label and set the appropriate text attributes in the dialog box that appears.

To circumvent the dialog box, first type a block of text and use Set Type to specify the desired font, size, and style. Then, for subsequent text entries, simply click on the original text to select it, and press ⌘-D to duplicate the selection. Highlight the text and start typing; the new text will conform to the style and size of the original text block. Although this method is still somewhat cumbersome, it's more efficient than filling in the Set Type dialog box each time you need to type some text.

The Type that Binds

Cricket Draw's Bind Text command performs an impressive PostScript feat: a line of text follows a path you draw on the screen. You may have to experiment to achieve good-looking results, especially if text is connected to a complex curving shape. The following tips should help beginning text-binders.

If you see a series of plus signs, rather than diagonal lines, after you select Bind Text, the line of text is longer than the shape to which it's bound; the program truncates such text when printed. Select Unbind Text and adjust the text or the path as necessary.

When text follows a tight curve, letters often mash together in the printed result. To ease the crowding, add a space between each pair of letters in words that curve sharply.

It's hard to judge the length of a line of text in relation to the length of the path to which it's bound; the text may not end up where you want it on the path. Fortunately, *Cricket Draw* lets you justify text at the left, right, or center of a path. Double-click on bound text to produce a text-justification dialog box. To fine-tune the position of a line of bound text, add spaces at the beginning or end before justifying.

Somewhere, over the rainbow.
Somewhere, under the rainbow.
Somewhere, under the rainbow.

Concave Art

The first sample shows text bound to a convex arc; the second, text bound to the same arc rotated 180 degrees; and the third, text attached to an arc created while holding down the Option key.

Binding text to an arc is fairly straightforward. If you need to create an arc-shaped phrase, for example, select the arc tool, press the Shift key to constrain the shape to a segment of a circle, and draw the arc. If you want the arc to span more than a quarter of a circle, select Edit Arc and drag one end of the arc until it's large enough. Bind a line of text to the arc and center it as explained above. So far, so good. But you'll need to employ a trick to bind a line of text to an inverted arc (the bottom half of a circle). I first tried to achieve this effect by rotating my original arc 90 degrees and then binding the text to it, but that just produces upside-down text. At last I learned the secret: to produce a concave arc, press both the Option and the Shift keys while drawing the arc. Repeat the arc-enlarging and text-centering steps just described, and bind the text to the arc (the results are shown in "Concave Art").

Tools at Your Command

With most Mac graphics programs, when you select an icon in the tool palette, the tool remains selected until you choose another one. Not so with *Cricket Draw*. When you finish drawing an object, the tool you just used is automatically deselected and the selection arrow tool is highlighted. This can prove annoying if you need to draw several objects of the same

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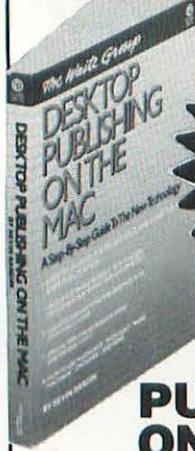
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How To/Mac Tools

type consecutively; it's as if with every nail you pounded in, the hammer flew back into your toolbox, forcing you to retrieve it again and again. Fortunately, if you hold down the **⌘** key after drawing with a particular tool, that tool remains selected, allowing you to use it as many times as necessary without returning to the tool palette. (The selection arrow will still be highlighted each time you finish drawing an object, but don't let that fool you.)

Grid Glitch

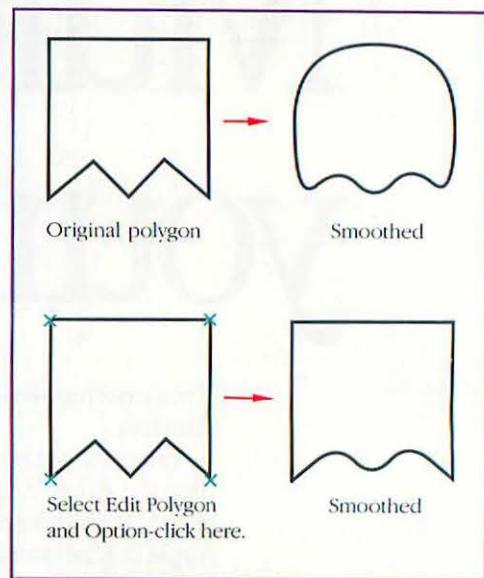
Cricket Draw's grid provides a snap-to option that automatically places an object on the nearest grid line when the object is moved. You may encounter a problem, however, if you duplicate an object and then attempt to line up the original and the copies along grid lines. When you choose the Duplicate command, a dialog box appears. The default setting specifies that duplicates of an object be offset 0.11 inch (8 pixels) horizontally and vertically from the original object. Unfortunately, duplicated objects don't line up correctly on the grid; each copy is off by a few pixels when you attempt to align it to the grid. There are two ways around this problem. The simplest is to set both the horizontal and vertical offsets in the Duplicate dialog box to 0; copies then stack up on the original object and align perfectly with the grid when you move them. Alternatively, select the original object and the duplicates and use the Align Objects command to keep them in line.

Similarly, if you paste an object into a drawing that has a grid, the object may not align properly with the grid lines. To correct the situation, choose Align Objects, selecting only the pasted object. Clicking Left Sides and Tops in the resulting dialog box will align the object with the grid.

For those occasions when you don't want to use the grid, here's a final tip for lining up objects. With most Macintosh graphics programs, you can constrain an object's movement to the vertical or horizontal by holding down the Shift key as you drag the object. *Cricket Draw*, however, uses the Option key for this function.

Curves and Straight Lines

Although the *Cricket Draw* manual mentions "composite objects" (objects made up of arcs, lines, and freehand polygons), this feature was not included in the final version of the program. You can, however, create objects that consist of both straight and curved lines. As you draw a shape with the freehand polygon tool,



Smooth plus Straight

With the help of the Option key, *Cricket Draw* enables you to combine straight lines and curves in a smoothed polygon.

hold down the Option key and double-click as you place each endpoint of a line you wish to keep straight; draw curved sections of the polygon normally, without the Option key. After you complete the polygon, double-click it to display a dialog box full of options. Select Smooth and watch what happens.

You can also add straight lines to a polygon you've already drawn. Select Edit Polygon, then hold down the Option key and click on the vertices of the edges you wish to keep straight. As before, double-click the polygon and select the Smooth option in the dialog box. The lines you Option-clicked remain straight, while the rest of the polygon is smoothed (see "Smooth plus Straight").

Speed Limitations

A number of factors slow *Cricket Draw's* screen display. When certain types of objects are displayed, the watch pointer appears frequently as you scroll. Several techniques speed up the display rate. The Preferences option allows you to turn off the animation (on-screen approximation) of text, bit maps, fountains, and shadows. That speeds up the screen-refresh rate when the objects or effects are redrawn. Smoothed polygons are also notoriously slow to redraw when scrolling. Wait until a drawing is nearly finished to smooth poly-

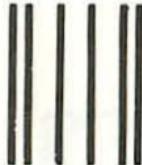
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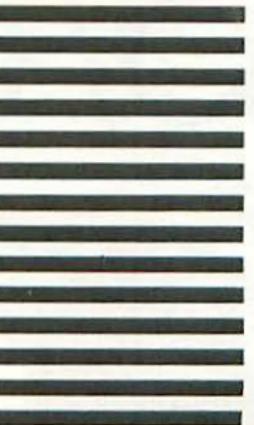
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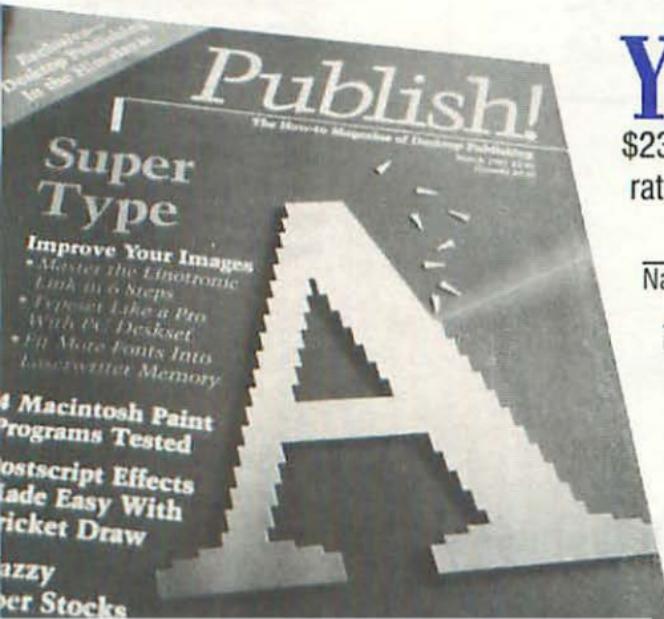
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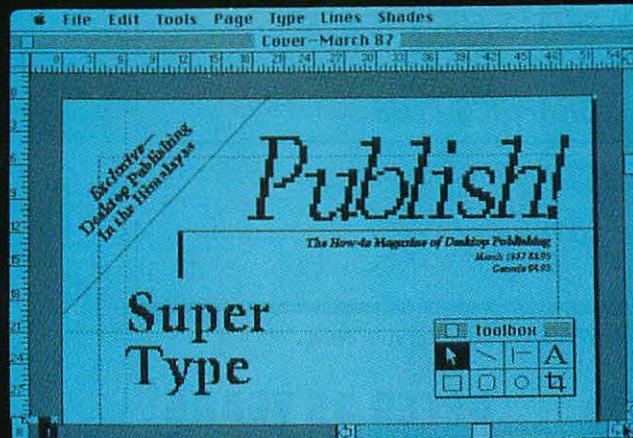
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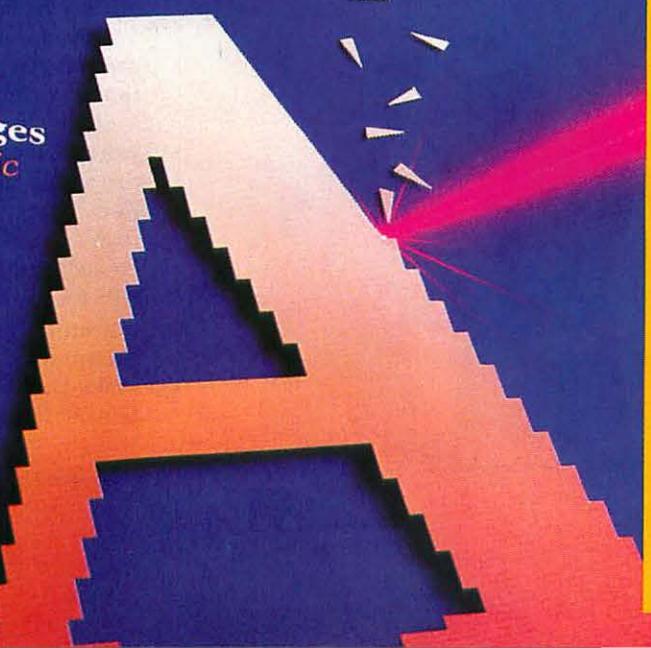
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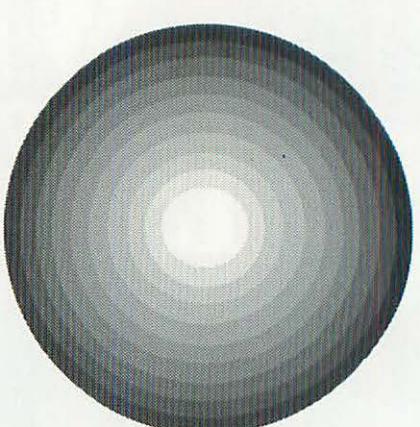
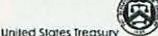
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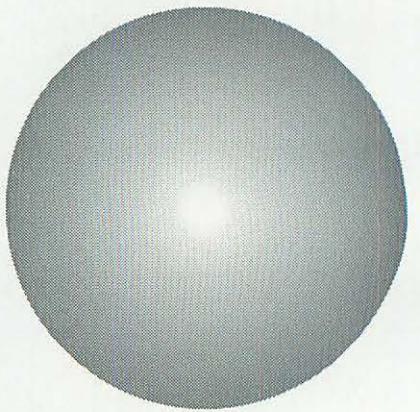
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Series of concentric circles



Radial fountain

Fake Fountain

The "radial fountain" (bottom) is actually a series of concentric circles filled with gradually changing shades of gray. Although constructing a fountain in this way defeats the purpose of Cricket Draw—the automatic creation of PostScript effects—it sure speeds up printing.

gons so that you can move about more quickly while you work.

As any experienced Cricket Draw user knows, radial fountains take a long time to print. This unfortunate fact can radically decrease your popularity with co-workers if your office Macs are connected to a single LaserWriter. If printer access is limited, consider constructing a poor man's radial fountain. Turn on the grid, create a series of concentric circles, select 0.05 for the border width and None for the border intensity, and fill each circle with progressively darker shades of gray (see "Fake Fountain"). Save your ersatz fountains in the Scrapbook for future use. This

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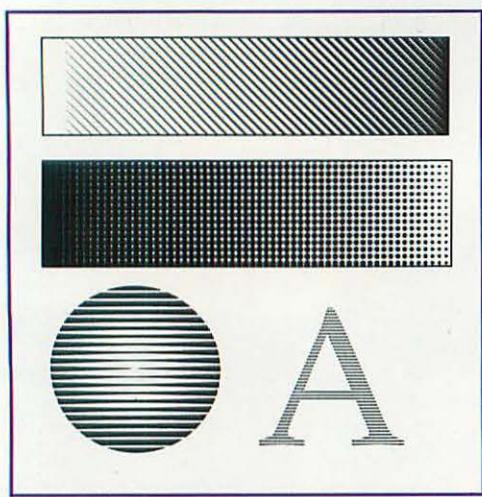
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**Objects à la Transfer Mode**

Here's a small sample of the effects you can achieve with Cricket Draw's hidden transfer modes, combined with various types of fountains.

is admittedly a kludge, but it may be worth the effort when you compare printing times (about 8 seconds for a fake fountain as opposed to about 6 minutes for a similar radial fountain in a test I ran).

Transfer Modes

Cricket Draw's manual neglects to mention one of its most exciting features. Hold down the Option key and click on the object fill control (the box in the lower-left corner of the screen) to access *Cricket Draw's transfer modes*. This option gives you access to PostScript's setscreen and set-transfer operators, which allow you to specify the number of lines per inch in a pattern, set the angle of the lines, and even shade with dots instead of lines (see "Objects à la Transfer Mode"). You can, for example, create a fountain of lines or dots rather than a simple transition from one gray to another. Transfer modes can be applied to objects or text, producing eye-catching effects (transfer modes don't apply to black or white objects, though). In addition to producing interesting patterns, graphic designers can use the transfer modes' Set Angle option to produce color separations in which each of four colors is set at a different angle.

Constructing Regular Polygons

Many people consider *Cricket Draw's* starburst tool cute but relatively useless. However, the starburst can serve as a practical aid in constructing regular polygons.

Take the pentagon... please. To construct a regular, five-sided shape, first press the Shift key and create a circular starburst. Double-click on the starburst to bring up its attributes dialog box. Set the increment to 72 (360 degrees divided by 5 sides equals 72) and click OK. You now have five lines, spaced at equal intervals, radiating from a central point. Now draw a circle, align the shape's L/R Centers and T/B Centers with the Align Objects command, and place five straight lines around the outside of the circle to finish the pentagon; use the Zoom In command to make sure the corners line up (see "A Starburst Is Reborn"). Change the increment in the dialog box to create shapes with any number of sides.

Making Masks

Unlike bit-map graphics programs such as *MacPaint*, *Cricket Draw* doesn't let you "erase" sections of a drawing. If you need to delete part of a drawing, mask the unwanted section with a shape whose border intensity is set to None (freehand polygons are especially versatile in the role of erasers). Use the Bring to Front command to position the mask.

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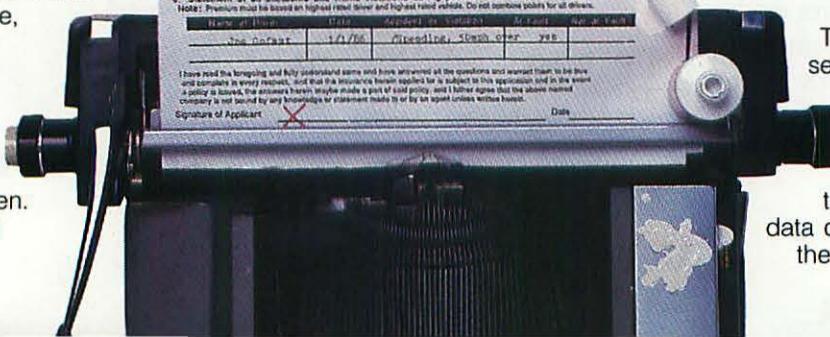
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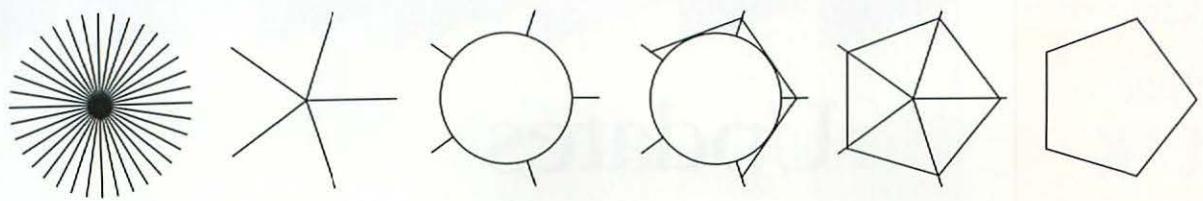
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A Starburst Is Reborn

Use Cricket Draw's starburst tool to create regular polygons such as this pentagon.

Closing Polygons

Have you ever had difficulty closing a freehand polygon? It can be tricky to align the cursor on the beginning point of the polygon and click to close the shape. There is an easier way. Double-click the last point to create an open polygon, then hold down the Option key and double-click anywhere on the shape; a line is automatically drawn between the last point and the beginning point, closing the polygon.

Common Misunderstandings

According to a member of Cricket's technical staff, users often misunderstand or misinterpret *Cricket Draw*. The following explanations should answer some of the more frequently asked questions.

Many people try to use the Color option in various dialog boxes to set an

object's color to white. This option is intended to be used when printing in color (at this point, that means on the ImageWriter II) and should not be applied to objects to be printed on a PostScript printer such as the LaserWriter. To make an object white, simply set its fill intensity to 0 in the object attributes dialog box (0 percent white equals black).

Cricket Draw accepts only 72-dot-per-inch bit maps, such as those produced in *MacPaint* or similar programs. It will not accept 300-dot-per-inch bit maps such as those produced by high-resolution scanners or 300-dpi editing features of programs like *FullPaint* and *SuperPaint*.

You will occasionally come across a grayed item, such as Edit Line or Edit Oval,

in the Edit menu. *Cricket Draw* always records what type of object is selected, and the Edit function is not available for shapes that have no vertices to edit.

Although I found writing this article exhausting, it is certainly not exhaustive. By all means experiment with *Cricket Draw*, especially with the Option key and with transfer mode effects. You'll undoubtedly discover tips and techniques of your own. On the one hand, it's annoying to work with a program with so many hidden features. On the other hand, you can think of yourself as an explorer, wending your way through uncharted—or at least undocumented—regions of a graphics program rich in resources. □

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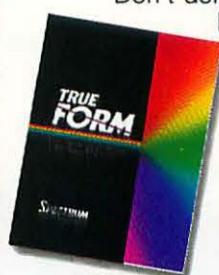


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Updates

This list brings you highlights of software updates recently received but not yet tested. The first price is the upgrade cost for registered owners; the second is the current list price.

AAIS PROLOG version M-1.15 fixes bugs, runs faster than the previous version, and has better memory management. Advanced A.I. Systems, P.O. Box 39-0360, Mountain View, CA 94039-0360, 415/961-1121. Free; \$150 new.

Forecast version 3.0 performs calculations that reflect the changes required by the Tax Reform Act of 1986. Star/Monogram Software, Inc., 367 Van Ness Way, Torrance, CA 90501, 213/533-1190. \$24.95; \$69.95 new.

MacMainFrame DX version 3.0 includes binary transfer, which allows transfer of non-Macintosh binary files to and from IBM mainframes, and text file filtering, which allows a Mac text document to be formatted to the host computer's standards of appearance. Avatar Technologies Inc., 99 South St., Hopkinton, MA 01748, 617/435-6872. Upgrade \$50; \$1195 new.

MacTablet version 4.0 fixes previous bugs. It also supports the Summa Sketch Professional and SCSI drives. Summagraphics Corp., 777 State St. Extension, Fairfield, CT 06430, 203/384-1344. Free; included with MacTablet (6 by 9 inches \$449, 12 by 12 inches \$599).

Mactran version 2.0 supports the Mac Plus, Mac SE, and Mac II. It includes complete ANSI 77 with extensions, and an integrated linker with the ability to generate stand-alone applications. DCM Data Products, 1710 Two Tandy Center, Fort Worth, TX 76102, 817/870-2202. \$40; \$199 new.

Minicad version 3.0 includes an additional 32 editable patterns, multiple windows, an automatic double-line tool for architectural applications, and a polygon merge option that allows you to add, subtract, or intersect. Diehl GraphSoft, Inc., 3246-K Normandy Woods Dr., Ellicott City, MD 21043, 301/461-9488. \$25; \$395 new.

Ragtime version 1.1 features soft hyphens, automatic page layout (including columns and rules), and the ability to import formatted text from other word processors and spreadsheets. Orange Micro Inc., 1400 N. Lakeview Ave., Anaheim, CA 92807, 714/779-2772. Free; \$395 new.

Trapeze version 1.1 enables you to import WKS data files directly and to specify foreign-currency formats. It includes new types of charts, password security for worksheets, and a comprehensive undo function. Data Tailor, Inc., 1300 S. University Dr. #409, Fort Worth, TX 76107, 817/332-8944. Free; \$295.

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Specialized fonts for the LaserWriter. Classical Greek \$85. Serif/sans serif for scientific texts \$75. Font of 100 chemical structures \$125 (with scientific text fonts \$160). Polish serif or sans serif \$85 each (4 styles). Serif small caps \$40. Regular or Polish (4 styles). Soon: modern Greek. MC/Visa. As mentioned in Feb. '87 issue. *Allotype Typographics*, 1600 Packard Rd. #5, Ann Arbor, MI 48104, 313/663-1989

FONTagenix & LASERgenix

FONTagenix™: 4 volumes of dot-matrix display fonts \$29.50 each vol.

(all 4 \$99.50) FOREIGN FONTS EDITION™: 22 foreign language fonts on disk, \$49.50. LASERgenix™: Downloadable laser fonts (New: extended Cyrillic) \$32.50 each. (Add \$3 s/h, CA res. add 6%). Write for samples or order at:

Devonian International Software, P.O. Box 2351, Montclair, CA 91763, 714/621-0973

Free PostScript Font

LaserFonts, the world's largest PostScript font library. 32 font families and growing. ITC fonts. Rated four mice by *MacUser*. For a free, full-function font, send blank disk and business size envelope with 76¢ postage. Catalog with full-page samples, \$2. Call or write for free info. *Century Software, Inc.*, 2483 Hearst Ave., #175, Berkeley, CA 94709, 415/549-1901, 213/829-4436

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B. Knick Drafting, 313 Marlin Pl., Melbourne Beach, FL 32951, 305/727-8071

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AAH Computer Graphics Productions, Box 4508, Santa Clara, CA 95054, 408/980-7363

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ScanMaster™, 2700 West Coast Hwy. #220, Newport Beach, CA 92663, 714/548-5967

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Qualitas Trading Co., 323 Monte Vista Ave., #307, Oakland, CA 94611, 415/547-1520

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CMA Micro Computer, 55888 Yucca Trail, P.O. Box 2080, Yucca Valley, CA 92286-2080, 619/365-9718

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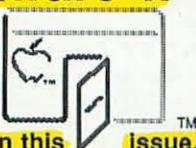
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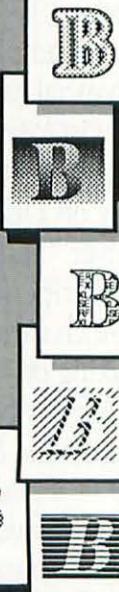
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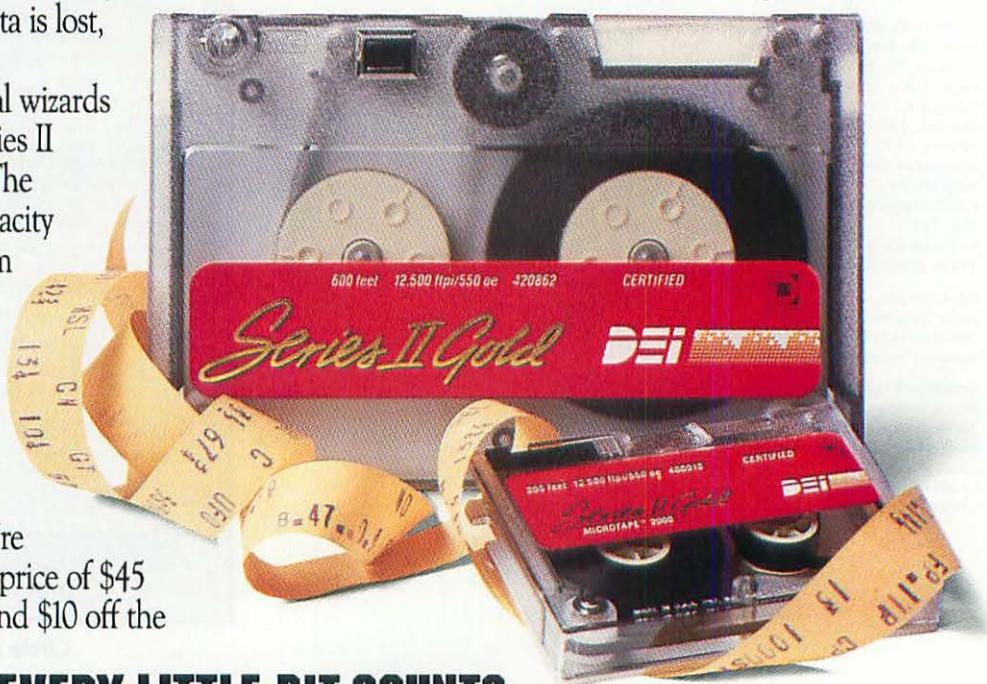
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Pages 108 to 113 *The Road to MS-DOS*

Apple PC 5.25 Drive

Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 1MB minimum memory. \$399.

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DaynaFile

Version 1.0. Dayna Communications, Inc., 50 S. Main St., 5th Floor, Salt Lake City, UT 84144, 801/531-0600, 800/531-0600. 512K minimum memory; requires SCSI port. \$595.

InBox

Version 2.0. Think Technologies, Inc., 135 South Rd., Bedford, MA 01730, 617/863-5590. 512K minimum memory; hard disk recommended. One administrator disk and three installer disks \$350, each additional installer \$125.

Jazz

Version 1A. Lotus Development Corp., 55 Cambridge Pkwy., Cambridge, MA 02142, 617/577-8500. Key-disk copy protection; installs on hard disks. 512K minimum memory; requires external drive. \$395.

Mac + PC

perfecTek Corp., 726 S. Hillview Dr., Milpitas, CA 95035, 408/263-7757. 512K minimum memory; Mac Plus, 5.25 Drive and attachments recommended. \$995.

Mac286

AST Research Inc., 2121 Alton Ave., Irvine, CA 92714, 714/553-0340 ext. 6190. Requires 5 1/4-inch drive and hard disk. Comes with 1MB of RAM. \$1499.

Mac86

AST Research Inc., 2121 Alton Ave., Irvine, CA 92714, 714/553-0340 ext. 6109. 1MB minimum memory; requires 5 1/4-inch drive and hard disk; needs 2MB expansion to attain a full 640K for MS-DOS. \$599.

MacCharlie

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Version 1.9 for the 400K disk; version 1.0 for the 800K disk. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 128K minimum memory; 512K with external drive recommended. \$195.

MacLinkPlus

Version 1.0. DataViz Inc., 16 Winfield St., Norwalk, CT 06855, 203/866-4944. 512K minimum memory; requires PC and serial port; external drive recommended. Includes disks for both machines, manual, and cable. \$195.

MacWrite

Version 4.5. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 128K minimum memory; 512K or more with external drive recommended. \$125.

Microsoft Excel

Version 1.04. Microsoft Corp., 1601 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400. 512K minimum memory; external drive recommended. \$395.

Microsoft Multiplan

Version 1.11. Microsoft Corp. (see *Microsoft Excel* for address). 128K minimum memory. \$195.

Microsoft Word

Version 3.01. Microsoft Corp. (see *Microsoft Excel* for address). 512K minimum memory; requires 800K drive storage; Mac Plus with external drive recommended. \$395.

PC MacBridge Plus

Version 3.0. Tangent Technologies, Ltd., 5720 Peachtree Pkwy. #100, Norcross, GA 30092, 404/662-0366. 256K minimum memory; requires MS-DOS version 2.1 or higher and two 5 1/4-inch drives. Includes *LaserScript*, *Mail Box*, *LaserGraph*, *PS Print*, *PSPS*, and *ATB*. \$650.

TangentShare

Version 1.0. Tangent Technologies, Ltd., 5720 Peachtree Pkwy. #100, Norcross, GA 30092, 404/662-0366. 256K minimum memory; requires MS-DOS 3.1 or higher, 5 1/4-inch drive. Software \$150, with card \$350.

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Public domain software.

Double Apple

Version 10.7.1986. Public domain software by Stefan Bilaniuk. Send donation to the Graduate Breakfast Fund, Dept. of Math and Computer Science, Dartmouth College, Hanover, NH 03755.

FEdit Plus

Version 2.0. MacMaster Systems, 108 E. Fremont Ave., Sunnyvale, CA 94087-3201, 408/773-9834. 512K minimum memory. \$49.95.

JClock

Version 3.1. Public domain software by James Sulzen and Edgar Matias.

KnockOut

Shareware by Andy Stadler. Box 603, Occidental College, 1600 Campus Rd., Los Angeles, CA 90041. Donation requested.

LaserStatus

Version 2.0. CE Software, 801 73rd St., Des Moines, IA 50312, 515/224-1995. 512K minimum memory; hard disk recommended. Free with purchase of *DiskTop*. \$39.95.

Mentor

Version 1.0. Target Software, Inc., 14206 S.W. 136th St., Miami, FL 33186, 305/252-0892, 800/622-5483. 512K

minimum memory; requires external drive for 512K. \$99.95.

Mentor Plus

Version 1.0. Target Software, Inc., 14206 S.W. 136th St., Miami, FL 33186, 305/252-0892, 800/622-5483. 512K minimum memory; requires hard disk. \$199.95.

MockChart

Version 4.3.4. CE Software, 801 73rd St., Des Moines, IA 50312, 515/224-1995. 128K minimum memory; 512K recommended. Bundled with *MockPackage Plus*.

ResEdit

Version 1.0.2 for System 3.0 or higher; version 1.0.1 for all other System versions. APDA, 290 S.W. 43rd St., Renton, WA 98055, 206/251-6548. 128K minimum memory. \$25 for APDA members.

Saviour

Public domain software.

ScreenLocker

Public domain software.

SideKick

Version 2.0. Borland International, Inc., 4585 Scotts Valley Dr., Scotts Valley, CA 95066, 408/438-9400, 800/255-8008, 800/742-1133. 512K minimum memory. \$99.95.

Smart Alarms and

Appointment Diary

Version 2.3 for *Smart Alarms*; version 2.7 for *Appointment Diary*. Imagine Software, 19 Bolinas Rd., Fairfax, CA 94930, 415/453-3944. 512K minimum memory; hard disk recommended. \$49.95.

SmartScrap and The Clipper

Version 1.02 for *SmartScrap*; version 1.01 for *The Clipper*. Solutions International, Inc., 29 Main St., Montpelier, VT 05602, 802/229-0368. 512K minimum memory. \$59.95.

Pages 128 to 137

Safety Net for Storage

Adon TD-40

Adon Corp., 10603 107th Ct. NE, Redmond, WA 98052, 206/881-5996. 1MB minimum memory. \$1495.

Apple Tape Backup 40SC

Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 1MB minimum memory. Requires SCSI cable and terminator. \$1499.

Backup Manager

Version 1.0. Adon Corp., 10603 107th Ct. NE, Redmond, WA 98052, 206/881-5996. 128K minimum memory. \$179.

Data File

NuData, 3206 Scott Blvd., Santa Clara, CA 95054, 408/727-1049. 512KE minimum memory; requires SCSI port for the 512KE. \$1295.

DataStream

SuperMac Technology, 295 N. Bernardo Ave., Mountain View, CA 94043, 415/964-8884. 512K minimum memory; requires SCSI port for the 512KE; Mac Plus recommended. \$1299.

HyperTape

General Computer Corp., 215 First St., Cambridge, MA 02142, 617/492-5500, 800/634-9737, 800/854-9737. 512K minimum memory; requires SCSI port for the 512KE. \$1399.

MacBack Plus 40

Peripheral Land, Inc., 47800 Westinghouse Dr., Fremont, CA 94538, 415/657-2211. 512K minimum memory; requires SCSI port for the 512KE. \$1295.

MacServe

Version 2.2. Infosphere, Inc., 4730 S.W. Macadam Ave., Portland, OR 97201, 503/226-3620. Copy detection; cannot be used by more than one server. 512K minimum memory; requires hard disk and AppleTalk. \$250 per server.

Network DiskFit

Version 1.2. SuperMac Software, 295 N. Bernardo Ave., Mountain View, CA 94043, 415/964-8884. 512K minimum memory; Mac Plus, external drive, tape drive or second hard disk recommended. \$395.

Plus-60T

Peak Systems, Inc., 1201 Spyglass, Austin, TX 78746, 512/328-0747, 800/225-7509. 1MB minimum memory; at least 30MB hard disk recommended. \$1295.

SoftBackup

Version 1.0. Diversified I/O Inc., 1008 Stewart Dr., Sunnyvale, CA 94086, 408/730-2171. 512K minimum memory; requires either floppy drive or standard tape drive; hard disk recommended. Single user \$69.95, network users \$139.95.

T-40

Mirror Technologies, Inc., 2209 Phelps Road, Hugo, MN 55038, 612/426-3276. 512K minimum memory; requires SCSI port for the 512KE. \$1459.

T60Plus

Relax Technology, Inc., 3101 Whipple Rd. #22, Union City, CA 94587, 415/471-6112, 800/848-1313; call collect within California. 512K minimum memory; requires SCSI port for the 512KE. \$1595.

TapeFit

Version 1.2. SuperMac Software, 295 N. Bernardo Ave., Mountain View, CA 94043, 415/964-8884. 1MB minimum memory; requires DataStream or DataFrame 40+40. Bundled with DataStream \$1299; bundled with DataFrame 40+40 \$2599.

TOPS

Version 1.0. Centram Inc., 2560 Ninth St. #210, Berkeley, CA 94710, 415/549-5900. Copy detection. 512K minimum memory; requires AppleTalk and hard disk. \$149 per Mac, \$389 per PC.

Pages 138 to 145

Top of the Charts

Cue: The Film Music System

Version 1.01. Opcode Systems, 444 Ramona St., Palo Alto, CA 94301, 415/321-8977. Key-disk copy protection. 512K minimum memory. Sonata fonts from Adobe highly recommended for Laser printing. \$499.

DataFrame XP 40

SuperMac Technology, 295 N. Bernardo Ave., Mountain View, CA 94043, 415/964-8884. 512K minimum memory; 512K requires DataPort and *DataPort Software*, 512KE requires DataPort only; Mac Plus recommended. \$1899.

FileMaker Plus

Version 2.0. Forethought, Inc., 250 Sobrante Way, Sunnyvale, CA 94086, 408/737-7070, 800/622-9273. 512K minimum memory; requires 800K of drive storage. \$295.

HyperDrive FX/20

General Computer Corp., 215 First St., Cambridge, MA 02142, 617/492-5500, 800/634-9737, 800/854-9737. 512K minimum memory; requires SCSI port for the 512KE. \$1199.

Jam Factory

Version 0.91. Intelligent Music, P.O. Box 8748, Albany, NY 12208, 518/434-4110. Key-disk copy protection. 512K minimum memory; requires MIDI interface; external drive recommended. \$120.

M

Version 0.94. Intelligent Music, P.O. Box 8748, Albany, NY 12208, 518/434-4110. Key-disk copy protection. 512K minimum memory; requires MIDI interface; external drive recommended. \$150.

Master Tracks Pro for the Macintosh

Version 1.0. Passport Designs, Inc., 625 Miramontes St. #103, Half Moon Bay, CA 94019, 415/726-0280. Key-disk copy protection. 512K minimum memory; requires MIDI interface; ex-

ternal drive or hard disk recommended. \$299.95.

Microsoft Excel

Version 1.04. Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400. 512K minimum memory; external drive recommended. \$395.

Microsoft File

Microsoft Corp. (see *Microsoft Excel* for address). 128K minimum memory. \$195.

Microsoft Word

Version 3.01. Microsoft Corp. (see *Microsoft Excel* for address). 512K minimum memory; requires 800K drive storage; Mac Plus with external drive recommended. \$395.

MIDI Paint

Version 1.0. Southworth Music System, 91 Ann Lee Rd., Harvard, MA 01451, 617/772-9471. 512K minimum memory; Mac Plus recommended; there will be a special version for the Mac II. \$149.

Music Mouse

Version 1.0. Opcode Systems, 444 Ramona St., Palo Alto, CA 94301, 415/321-8977. 128K minimum memory. \$60.

Opcode Sequencer

Version 2.5. Opcode Systems, 444 Ramona St., Palo Alto, CA 94301, 415/321-8977. Key-disk copy protection; allows two hard disk installations. 512K minimum memory; requires MIDI interface; external drive or hard disk recommended. \$250.

OverVue

Version 2.1a. ProVue Development, 222 22nd St., Huntington Beach, CA 92648, 714/969-2431. 128K minimum memory; external drive recommended. \$295.

PackIt III

Version 1.2. Shareware by Harry Chesley. 1850 Union St. #360, San

Francisco, CA 94123. 512K minimum memory. Current version \$10; current version and future upgrades \$20.

Performer

Version 1.22. Mark of the Unicorn, Inc., 222 Third St., Cambridge, MA 02142, 617/576-2760. Not copyable; backup disk mailed upon receipt of registration card. 512K minimum memory; requires MIDI interface. \$295.

Professional Composer

Version 2.0. Mark of the Unicorn, Inc., 222 Third St., Cambridge, MA 02142, 617/576-2760. Not copyable; backup disk mailed upon receipt of registration card. 512K minimum memory. \$495.

SmoothTalker

Version 2.0. First Byte, Inc., 2845 Temple Ave., Long Beach, CA 90806, 213/595-7006. Key-disk copy protection: 512K minimum memory. \$49.95.

Sound Design

Version 1.12. Digidesign, Inc., 1360 Willow Rd. #101, Menlo Park, CA 94025, 415/327-8811. Key-disk copy protection; installs on hard disks. 512K minimum memory; requires external drive; Mac Plus with hard disk recommended. Mirage version \$395, all other versions \$495.

Page 146

A Portable Finder

DiskTop

Version 2.0. CE Software, 801 73rd St., Des Moines, IA 50312, 515/224-1995. 512KE minimum memory. \$39.95.*

Page 148

XPress! XPress! Read All About It!

XPress

Version 1.01. Quark Inc., 2525 W. Evans #220, Denver, CO 80219, 303/934-2211. Copy protected; allows three installations to floppies or hard disk. 512KE minimum memory; requires external drive or hard disk. \$695.*

Page 150 Check It Out

Spellswell

Version 1.3j. Working Software, Inc., 321 Alvarado, Ste. H, Monterey, CA 93940, 408/375-2828, 800/331-4321, 800/851-1986. 512K minimum memory. \$74.95, medical dictionary \$99.95.*

Page 151

The Perils of Normandy

Patton vs Rommel

Electronic Arts, 1821 Gateway Dr., San Mateo, CA 94404, 415/571-7171. Not copyable. 512K minimum memory; Mac Plus with external drive recommended. \$39.95.*

Page 151

Easy Ways to Excel

Check Book

Version 1.1. Heizer Software, 5120 Coral Ct., Concord, CA 94521, 415/827-9013. 512K minimum memory; requires *Microsoft Excel*; external drive recommended. \$15, demo disk \$2.*

Guided Tour

Version 1.2. Heizer Software, 5120 Coral Ct., Concord, CA 94521, 415/827-9013. 512K minimum memory; requires *Microsoft Excel*; external drive recommended. \$15, demo disk \$2.

Microsoft Excel

Version 1.04. Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400. 512K minimum memory; external drive recommended. \$395.

Personal Budget

Version 1.1. Heizer Software, 5120 Coral Ct., Concord, CA 94521, 415/827-9013. 512K minimum memory; requires *Microsoft Excel*; external drive recommended. \$15, demo disk \$2.*

(continues)

Where to Buy

Page 153

A Programming Language

API Plus System

for the Macintosh

Version 1.0. STSC, Inc., 2115 E. Jefferson St., Rockville, MD 20852, 301/984-5123, 800/592-0050. 512K minimum memory. \$395.*

Macintosh 68000

Development System

Version 2.0. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 512K minimum memory; 512K with external drive recommended. \$195.

Page 154

Billing Your Clients

Project Billing

Version 1.35. Satori Software, 2815 Second Ave. #590, Seattle, WA 98121, 206/443-0765. 512K minimum memory; 800K drive storage recommended. \$695, Project Billing + \$1095.*

Page 156

Made to Specification

MacSpec

Version 2.0. LM Software, P.O. Box 93, Belmont, CA 94002, 415/345-0388. 512K minimum memory. \$199.95.

Page 157

Seize the Data

Data Desk

Version 1.06. Data Description, Inc., P.O. Box 4555, Ithaca, NY 14853, 607/257-1000. 512K minimum memory; requires 800K drive storage. \$175. Student version (\$38) available from Kinko's Academic Courseware Exchange, 4141 State St., Santa Barbara, CA 93110, 800/235-6919.*

Page 158

Fast Relief for Security

Headaches

Hard Disk Partition

Version 1.05. FWB Software, Inc., 2040 Polk St. #215, San Francisco, CA 94109, 415/474-8050. 512K minimum memory; Mac Plus with SCSI hard drive recommended. \$54.95.*

Page 159

Gender-Specific Leather and Lace

Leather Goddesses of Phobos

Release 59. Infocom, 125 Cambridge Park Dr., Cambridge, MA 02140, 617/576-3190, 800/262-6868. 128K minimum memory. \$39.95.*

Moonmist

Release 59. Infocom, 125 Cambridge Park Dr., Cambridge, MA 02140, 617/576-3190, 800/262-6868. 128K minimum memory. \$39.95.*

Page 160

High-Power Communications

inTalk

Version 2.11. Palantir Software, 12777 Jones Rd. #100, Houston, TX 77070, 800/368-3797, 800/831-3119. 512K minimum memory. \$199.*

Page 162

Making It Big

inLarge

Version 1.0. Berkeley System Design, 1708 Shattuck Ave., Berkeley, CA 94709, 415/540-5537. 512K minimum memory. \$95.*

Pages 193 to 202

Getting Started with Macintosh Graphics

CheapPaint

Spinnaker Software Corp., 1 Kendall Sq., Cambridge, MA 02139, 617/494-1200. Key-disk copy protection. 512K minimum memory. Bundled with MUD. \$49.95.

Cricket Draw

Version 1.01. Cricket Software, Inc., 30 Valley Stream Pkwy., Malvern, PA 19355, 215/251-9890, 800/345-8112. 512K minimum memory; external drive and LaserWriter recommended. \$295.

Cricket Graph

Version 1.1. Cricket Software, Inc. (see *Cricket Draw* for address). 512KE minimum memory; external drive and LaserWriter recommended. \$195.

FullPaint

Version 1.1. Ann Arbor Softworks, Inc., 2393 Teller Rd. #106, Newbury Park, CA 91320, 805/375-1467. 512K minimum memory; external drive recommended. \$99.95.

FullWrite Professional

Version 1.0. Ann Arbor Softworks, Inc. (see *FullPaint* for address). 1MB minimum memory; external drive recommended. \$295.

GraphicWorks

Version 1.1. Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062, 312/480-7667, 800/221-9884, 800/942-7315. 512K minimum memory; requires external drive. \$99.95.

Illustrator

Version 1.1. Adobe Systems, Inc., 1870 Embarcadero Rd., Palo Alto, CA 94303, 415/852-0271, 800/292-3623. Key-disk copy protection. 1MB minimum memory; scanning device and laser printer highly recommended. \$495.

Jazz

Version 1A. Lotus Development Corp., 55 Cambridge Pkwy., Cambridge, MA 02142, 617/577-8500. Key-disk copy protection; installs on hard disks. 512K minimum memory; requires external drive. \$395.

LaserPaint

Version 1.1. LaserWare, Inc., P.O. Box 668, San Rafael, CA 94915, 415/453-9500, 800/367-6898. Key-disk copy protection; installs on hard disks. 1MB minimum memory; hard disk or external drive recommended. \$495.

Mac3D

Version 2.0. Challenger Software Corp., 18350 Kedzie Ave., Homewood, IL 60430, 312/957-3475. 512K minimum memory; requires 800K drive storage; external drive recommended. \$249.

MacDraft

Version 1.2a. Innovative Data Design, Inc., 2280 Bates Ave., Ste. A, Concord, CA 94520, 415/680-6818. 512K minimum memory; external drive recommended. \$269.

MacDraw

Version 1.9 for the 400K disk; version 1.0 for the 800K disk. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 128K minimum memory; 512K with external drive recommended. \$195.

MacMovies

Version 1.2. Beck-Tech, 41 Tunnel Rd., Berkeley, CA 94705, 415/548-4054. 512K minimum memory; external drive recommended. \$99.

MacPaint

Version 1.5. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 128K minimum memory. 512K with external drive recommended. \$125.

Microsoft Chart

Version 1.02. Microsoft Corp., 1601 N.E. 36th Way, Box 97017, Redmond, WA 98073, 206/882-8080, 800/426-9400. 128K minimum memory. \$125.

Microsoft Excel

Version 1.04. Microsoft Corp. (see *Microsoft Chart* for address). 512K minimum memory; external drive recommended. \$395.

Microsoft Works

Version 1.01. Microsoft Corp. (see *Microsoft Chart* for address). 512K minimum memory; external drive recommended. \$295.

PageMaker

Version 2.0. Aldus Corp., 411 First Ave. S #200, Seattle, WA 98104, 206/622-5500. 512K minimum memory; requires 512K with hard disk or 512KE with 800K external drive; Mac

Plus with hard drive and PostScript printer recommended. \$495.

Phoenix 3D Level One

Version 1.2. Dreams of the Phoenix, Inc., P.O. Box 10273, Jacksonville, FL 32247, 904/396-6952. 512K minimum memory; external drive recommended. \$49.95.

PowerPoint

Version 1.0. Forethought, Inc., 250 Sobrante Way, Sunnyvale, CA 94086, 408/737-7070, 800/622-9273. 512K minimum memory; Mac Plus with external drive recommended. \$395.

Pro3D

Version 1.0. Enabling Technologies, Inc., 600 S. Dearborn St. #1304, Chicago, IL 60605, 312/427-0408. 512K minimum memory. \$349.

ReadySetGo

Version 4.0. Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653, 201/845-6100, 800/526-9073. 512K minimum memory; 512K with external drive recommended. \$395.

Scoop

Version 1.0. Target Software, Inc., 14206 S.W. 136th St., Miami, FL 33186, 305/252-0892, 800/622-5483. 512K minimum memory. \$495.

Smartcom II

Version 2.2b. Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348, 404/441-1617. 128K minimum memory. \$149.

SpaceEdit

Version 2.0. Abvent, 9903 Santa Monica Blvd. #268, Beverly Hills, CA 90212, 213/659-5157. Key-disk copy protection. 512K minimum memory; Mac Plus with external drive recommended. \$625.

SuperPaint

Version 1.0. Silicon Beach Software, Inc., P.O. Box 261430, San Diego, CA 92126, 619/695-6956. 512K minimum memory; Mac Plus recommended. \$99.

Switcher

Version 5.01. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 128K minimum memory; 512K recommended. \$19.95.

Tempo

Version 1.2. Affinity Microsystems, Ltd., 1050 Walnut St. #425, Boulder, CO 80302, 303/442-4840, 800/367-6771. 512K minimum memory. \$99.

Trapeze

Version 1.1. Data Tailor, Inc., 1300 S. University Dr. #409, Fort Worth, TX 76107, 817/332-8944, 800/443-1022. 512K minimum memory; external drive recommended. \$295.

VideoWorks

Spinnaker Software Corp., 1 Kendall Sq., Cambridge, MA 02139, 617/494-1200. Key-disk copy protection. 128K minimum memory. \$99.95.

Pages 205 to 214

Insights on More

Acta

Version 1.2. Symmetry Corp., 761 E. University Dr., Mesa, AZ 85203, 602/844-2199, 800/624-2485. 128K minimum memory; 512K recommended. \$59.95.

Cricket Draw

Version 1.01. Cricket Software, Inc., 30 Valley Stream Pkwy., Malvern, PA 19355, 215/251-9890, 800/345-8112. 512K minimum memory; external drive and LaserWriter recommended. \$295.

FullPaint

Version 1.1. Ann Arbor Softworks, Inc., 2393 Teller Rd. #106, Newbury Park, CA 91320, 805/375-1467. 512K minimum memory; external drive recommended. \$99.95.

MacDraw

Version 1.9 (400K disk); version 1.0 (800K disk). Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 128K minimum memory. 512K with external drive recommended. \$195.

More

Version 1.1. Living Videotext, Inc., 117 Easy St., Mountain View, CA 94043, 415/964-6300. 512K minimum memory; requires external drive; hard disk recommended. \$295.

PageMaker

Version 2.0. Aldus Corp., 411 First Ave. S #200, Seattle, WA 98104, 206/622-5500. 512K minimum memory; requires 512K with hard disk or 512KE with 800K; Mac Plus with hard drive and PostScript printer recommended. \$495.

Preview

Version 1.3. Shareware by Computer Applications, Inc., 12813 Lindley Dr., Raleigh, NC 27609, 919/846-0023. 512K minimum memory. \$10.

ReadySetGo

Version 4.0. Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653, 201/845-6100, 800/526-9073. 512K minimum memory; 512K with external drive recommended. \$395.

Spellspell

Version 1.3J. Working Software, Inc., 321 Alvarado, Ste. H, Monterey, CA 93940, 408/375-2828, 800/331-4321, 800/851-1986. 512K minimum memory. \$74.95, medical dictionary \$99.95.

SuperPaint

Version 1.0. Silicon Beach Software, Inc., P.O. Box 261430, San Diego, CA 92126, 619/695-6956. 512K minimum memory; Mac Plus recommended. \$99.

Switcher

Version 5.01. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA, 95014, 408/996-1010. 128K minimum memory; requires 512K with hard disk or 512KE with 800K; Mac Plus with hard drive and PostScript printer recommended. \$495.

ThinkTank 512

Version 1.3. Living Videotext, Inc., 117 Easy St., Mountain View, CA 94043,

415/964-6300. 512K minimum memory; external drive recommended. \$195.

Thunder

Version 1.01. Electronic Arts/Batteries Included, 1820 Gateway Dr., San Mateo, CA 94404, 415/578-0316. 512K minimum memory. \$49.95.

Pages 217 to 225

Mac Graphics Tools

Cricket Draw

Version 1.01. Cricket Software, Inc., 30 Valley Stream Pkwy., Malvern, PA 19355, 215/251-9890, 800/345-8112. 512K minimum memory; external drive and LaserWriter recommended. \$295.

FullPaint

Version 1.1. Ann Arbor Softworks, Inc., 2393 Teller Rd. #106, Newbury Park, CA 91320, 805/375-1467. 512K minimum memory; external drive recommended. \$99.95.

MacDraw

Version 1.9 (400K disk); version 1.0 (800K disk). Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 128K minimum memory; 512K with external drive recommended. \$195.

MacPaint

Version 1.5. Apple Computer, Inc. (see *MacDraw* for address). 128K minimum memory; 512K with an external drive recommended. \$125.

PageMaker

Version 2.0. Aldus Corp., 411 First Ave. S #200, Seattle, WA 98104, 206/622-5500. 512K minimum memory; requires 512K with hard disk or 512KE with 800K; Mac Plus with hard drive and PostScript printer recommended. \$495.

SuperPaint

Version 1.0. Silicon Beach Software, Inc., P.O. Box 261430, San Diego, CA 92126, 619/695-6956. 512K minimum memory; Mac Plus recommended. \$99. □

Macworld Best-Sellers

Months on chart

Last month

This month

Business Software		
26	1	1 Microsoft Word Microsoft
6	2	2 Microsoft Works Microsoft
18	3	3 Microsoft Excel Microsoft
14	4	4 PageMaker Aldus
5	10	5 SuperPaint Silicon Beach Software
10*	6	6 MacWrite Apple Computer
23	5	7 MacDraw Apple Computer
10*	7	8 MacPaint Apple Computer
10	9	9 Omnis 3 Blyth Software
6	-	10 MacDraft Innovative Data Design

Education Software		
10	1	1 Math Blaster Davidson and Associates
10	2	2 KidsTime Great Wave Software
6	3	3 MasterType Scarborough Systems
9	-	4 Typing Tutor III Simon and Schuster Computer Software

Entertainment Software		
10	1	1 Flight Simulator Microsoft
6	2	2 Dark Castle Silicon Beach Software
10	4	3 MacGolf Practical Computer Applications
2	-	4 Balance of Power Mindscape
5	-	5 The Ancient Art of War Broderbund Software

Networking/Data Communications		
6	2	1 TOPS Centram Systems
10	1	2 AppleTalk Apple Computer
10	3	3 MacServe Infosphere
2	4	4 AppleShare Apple Computer
17	5	5 MacTerminal Apple Computer

Months on chart

Last month

This month

Hard Disk Drives		
6	1	1 Apple HD-20SC Apple Computer
9	3	2 Apple Hard Disk 20 Apple Computer
10	2	3 DataFrame 20 SuperMac Technology
9	5	4 HyperDrive 20 General Computer
1	-	5 Rodime 20 Plus Rodime Peripheral Systems Division

Books

Books		
10	1	1 Excel in Business Douglas Cobb, Microsoft Press
9	2	2 Inside Macintosh Addison-Wesley
4	3	3 Creative Programming in Microsoft BASIC Steve Lambert, Microsoft Press
3	5	4 Microsoft BASIC Book/Macintosh Edition Walter A. Ettlin and Gregory Solberg, Osborne/McGraw-Hill
10	4	5 The Printed Word David A. Kater and Richard L. Kater, Microsoft Press

Product Watch

Editors' choice:

Other recent products of particular interest:

FindsWell Working Software Finder enhancement software

The Realist Letraset gray-scale graphics program

Super 3D Silicon Beach Software color 3-D graphics

Source: Exclusive InfoCorp survey of more than one hundred Macintosh retailers and selected mail-order suppliers. Covers sales during April 1987.

*Formerly bundled with the Mac.

The Word is Out...

“Absolutely AMAZING word processing program. I want it WriteNow! ”

Robert Forras,
MacTimes

“This is the word processor that we designed and built Macintosh for. ”

Steve Jobs,
NeXT Inc.

“WriteNow feels perfect... It's hot. Highly recommended. This is THE word processor to use if you use a Mac. ”

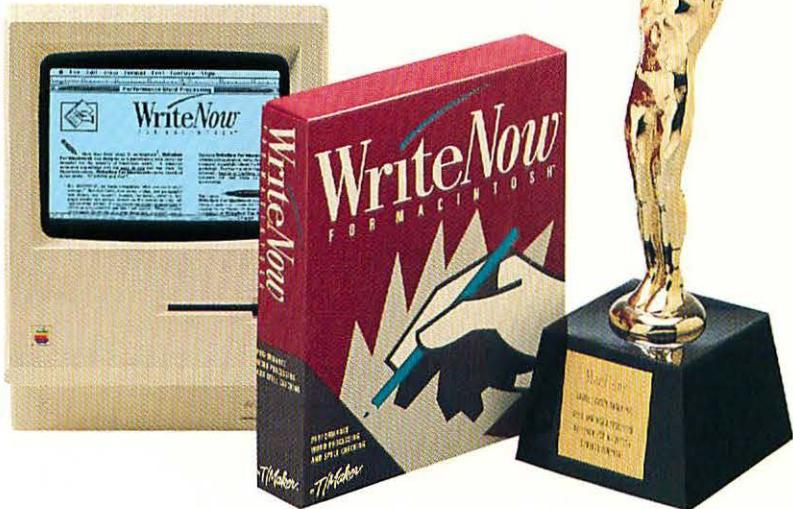
John Dvorak,
San Francisco Examiner

“Right now, WriteNow comes the closest to delivering on the promise of future word processing. ”

Michael Miller,
InfoWorld

“T/Maker's WriteNow For Macintosh is a polished word processor that retains the elegance of MacWrite but adds features like multiple windows, footnotes, multiple columns, and a spell checker. ”

Dan Farber,
MacWorld Magazine



Best New Word Processor
MacUser Magazine 1986

“...WriteNow adds up to a great new word processor. ...its ease of use and speed put it way ahead of Microsoft Word and MacWrite for most jobs. ”

Vicky Jo Varner,
The MACazine

WriteNow[®]

FOR MACINTOSH™

Performance Word Processing for the Macintosh

To learn more, see your local computer dealer today, or call or write to:
T/Maker Company, 1973 Landings Drive, Mountain View, CA 94043 (415) 962-0195

Suggested retail price of WriteNow For Macintosh is \$175. Runs on any Macintosh.

T/Maker is a registered trademark of T/Maker Co. WriteNow is a trademark licensed to T/Maker Co.
Macintosh and MacWrite are trademarks of Apple Computer, Inc.

Circle 332 on reader service card

Pagemaker 2.0 now
imports & exports
WriteNow
documents.

T/Maker[®]

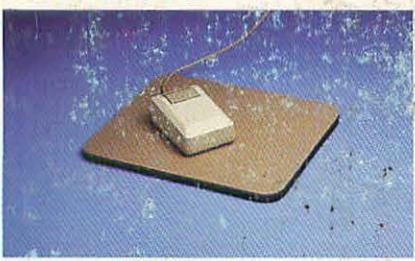
Our engineers have never had a suntan.



System Saver Mac, \$99.95*



Tilt/Swivel, \$34.95



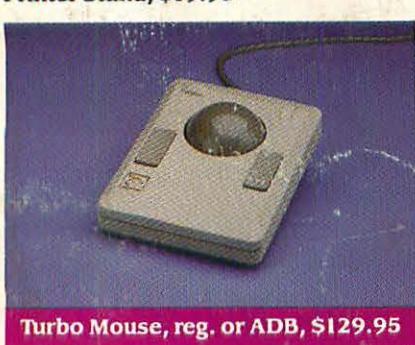
Mouseway, \$9.95



Anti-Glare Filter, \$49.95*



Printer Stand, \$19.95



Turbo Mouse, reg. or ADB, \$129.95

This time of year, most people enjoy lying on the beach, soaking up the sun. Not our engineers. They'd rather be in the office, thinking up new Maccessories®.

It was the same last summer. They got a bigger kick out of designing System Saver® Mac than most people get from a month at the shore.

This winter, when they dreamed up Turbo Mouse™ and Printer Mufflers, we offered them a bonus trip to Jamaica, but they were having too much fun to go.

This summer it's the new ADB Turbo Mouse and Mouse Pocket for the Mac SE and Mac II. An Apple® Security System (to keep your Mac from going to the beach without you). And a Disk Pocket (so you can spend more time running applications, and less time running to your disk case).

For a free brochure, or information on where to buy all this great stuff, call (800) 535-4242. In NY, call (212) 475-5200.

And don't feel too bad for these guys. We're taking them to the beach for a barbecue on Labor Day. If we can get them out of the office.

KENSINGTON ◇



Apple Security System, \$49.95



Disk Pocket, \$9.95



Copy Stand, \$29.95



Printer Muffler 80, \$59.95



AppleTalk Clips, \$25.00 for 25



Dust Covers, \$9.95 to \$13.75



Mouse Pocket, reg. or ADB, \$9.95



Disk Drive Cleaning Kit, \$29.95

*Available in two colors — original Apple Beige and new Apple Platinum.

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